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A study for increasing reusable cup consumption in the coffee industry: focused on behavior change with motivation

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A study for increasing reusable cup consumption in the coffee industry:

Focused on behavior change with motivation

by

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A thesis submitted to the graduate faculty

in partial fulfillment of the requirements for the degree of

MASTER OF FINE ARTS

Major: Graphic Design

Program of Study Committee:

Roger Baer, Major Professor

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ABSTRACT

The use of reusable cups as a solution for the issues on waste and environment destruction has been brought up and is not that of a new topic. Although this has been an issue for decades and there had been suggested solutions, we still could not solve the problem until now. The issue is getting worse with the recent expansion of the hot beverage business market.

I believe we have to change our perspective on how we view the problem. It's not that people can not recognize or are ignoring this problem, they just have a hard time putting it into action. It is necessary to find out if there is a more fundamental problem in the series of actions required to the people to solve the problem. In this perspective, this research first checks whether the customers of the hot beverage business, that use the largest amount of disposal cups, are aware of the issue. Next, if they are aware find out what stops them from taking action. Finally, by proposing new solutions for the causes, help the consumers actively reduce the consumption of disposable cups and rather use reusable cups instead.

In order to approach the goal that was mentioned beforehand, I have visited a local beverage shop that had the biggest crowd of customers and conducted a survey and interviews. (Appendix B) Through this process of involving in the scene, it was able to define the substantial problems, while also applying the most representative behavioral change theory, 'Stage of Change Theory'. This

theory classifies and defines the consumers' behavior in stages and provides a solution for an appropriate behavioral change in each stage. It proposes an effective guide line on how the consumers should determine what to do. Also, find the elements that can be solved with the designers' view out of a variety of solutions that can come out of each stage. After defining the elements provide a solution with design.

We can define the role of the design area apart from other various academic approaches of behavior change of people through this process. I hope design is not just an assistance for behavioral change, but that the designer has a basis and motive to actively involve in each stage of behavioral change. But first, with a more certain form of design motive in the topic 'hot beverage business', draw the consumers' changing behavior and provide various motivations that the change can last, increasing the use of reusable cups.

CHAPTER 1. INTRODUCTION

Due to the busy lifestyle of modern day people, holding and drinking out of a beverage cup on a road is a familiar scene in the TV shows and films. It is already regarded as a culture of modern life in the world. Before 1990, however, people could just enjoy cool beverages outside using PET (polyethylene terephthalate) bottles or aluminum cans. With the success of Starbucks in the hot beverage market, coffee industries and other hot beverage markets have grown dramatically. As of 2002, coffee consumption had risen with more than half of the population of United State of America (about 109 million people) drinking coffee every day, and an additional fifty-two million drinking coffee on an occasion. So holding a coffee in a paper cup can be represented as the modern lifestyle rather than holding bottles or cans. These cultural changes have led to a huge problem of using paper cups, because increasing coffee consumption brought huge paper cup consumption as well. Consequently, this environmental concern is one of the hot issues in coffee industries today.

1.1 Overview of Terms

This research focuses on finding a solution for making people to change their behavior of wasting produced by the global coffee industry from using disposable cups. Over a billion cups of hot beverages are purchased in the world each day creating a large volume of waste. The purpose of this research is to find some reasonable solutions for reducing the waste in order to increase sustainability. In doing so, this project looked at a globally branded coffee shop, Starbucks. At a location, in Ames Iowa, I surveyed customers to learn about their behaviors about using disposable cups and interviewed some customers in the shops. (Appendix B) Because Starbucks is one of the biggest hot beverage brands in the world, as of October 2011 they have 10,787 stores in United

States and 6,216 international stores.¹ This means they are consuming huge amounts of paper cups everyday in the world. Starbucks already had interest in their paper cup problem and attempted various methods to solve the situation. In 2008, they started a global responsibility strategy called ‘Shared Planet.’ This campaign stated some goals such as improving coffee farmer’s access to carbon markets, helping them generate additional income while protecting the cultural environment, developing a comprehensive recycling solution for used paper and plastic cups, implementing front-of-store recycling in owned stores and so on.

Table 1: Top 100 chains: U.S. sales, all results are in \$ millions.
<http://nrm.com/us-top-100/top-100-chains-us-sales>

Rank	Chain	Segment	2011	2010	2009
1	McDonald's	Sandwich	\$34,172.0	\$32,395.4	\$31,032.6
2	Subway	Sandwich	\$11,434.0	\$10,633.0	\$9,999.3
3	Starbucks Coffee	Beverage-Snack	\$8,490.0	\$7,955.0	\$7,415.0
4	Burger King	Sandwich	\$8,131.0	\$8,433.0	\$8,799.0
5	Wendy's	Sandwich	\$8,108.0	\$7,943.0	\$8,023.0
6	Taco Bell	Sandwich	\$7,000.0	\$6,900.0	\$6,800.0
7	Dunkin' Donuts	Beverage-Snack	\$5,931.0	\$5,420.0	\$5,176.0
8	Pizza Hut	Pizza	\$5,500.0	\$5,400.0	\$5,000.0
9	KFC	Chicken	\$4,600.0	\$4,700.0	\$4,900.0
10	Applebee's Neighborhood Grill & Bar	Casual Dining	\$4,428.1	\$4,317.0	\$4,397.4

¹ Starbucks Corporation, *Starbucks Corporation 2011 Annual Report, Form 10-K*, Starbucks Corporation, 2011, p3

Most of the goals of Starbucks corporate strategy seem to be achieved before the time they are expected to take, one goal still remains at a standstill. That goal is serving reusable cups at least 25% until 2015, but from 2009 to 2012 it stayed the same 1.5%. Finally they changed the goal to 5% from 25%, but this rate would be not easy as well.² As it appears that either this goal is an impossible one to achieve or that Starbucks is looking for another solution, and this was an area of interest for design research.

1.2 Research Methods

I used several research methods for this research. The first area of research was using standard journal research to discover why people did not act in contrast with their values about recycling. Journal research in psycho papers, behavior change theories, reusable alternative cups and graphic design areas yielded some results. The literature review helped my research to acquire a variety of perspectives about these issues. The second method was a survey, I built a survey of hot beverage purchaser's behaviors and interviewed some volunteers at the local Starbucks. These surveys and interviews enabled me to understand the perception of customers about using reusable cups and paper cups. Lastly, I found and introduced some case studies that relates to this issue.

1.3 Problem Observations

1.3.1 Coffee market in the world and North America

According to a report from the Specialty Coffee Association of America, the retail value of the U.S. coffee market was estimated to be about \$32 billion dollars in 2010. France,

² Starbucks Corporation, *Starbucks Global Responsibility Report – Goals and Progress*, Starbucks Corporation, 2012, p11

Germany, Italy, Japan, and the United States are the five biggest coffee importing markets in the global consumptions. Their global consumption bounced to about 37.3 million bags during the period of January to September 2010, as compared to 36.5 million bags for the same period the previous year. In recent years, there has been a huge surge demand of Arabica coffee from large, emerging markets including Brazil, India, and China. These countries have growing middle classes who have been providing high demand for good coffee and they are competing with the United States to purchase these gourmet coffee beans. Therefore, it can be said that the global coffee market is an industry that is going to continue to grow and develop.³

1.3.2 What is the problem of using paper cups?

As I mentioned above before the growing coffee markets, beverage retail markets were based on cool drinks such as soft drink, beer, water and so on. The cool beverage products were contained by aluminum cans or glass bottles that were recyclable packaging materials. It seemed that the only environmental problem of the beverage market was the usage of PET bottles; however, after the expansion of hot beverage markets, paper cup consumption has become one of the big environmental issues. In this research I will focus on the reusable package design and service design for hot beverage retail markets. The food-packaging industry is one of the most remarkable non eco-friendly packaging market (Aaron L. Brody et al, 2008, Ann Lorentzon, 2011). The environmental problems associated with using disposable materials such as paper cups and PET cups are only accentuated by their

³ Specialty Coffee Association of America, *2012 Coffee Facts and Statistics*, SCAA, 2012, P2

widespread usage among coffee drinkers. Considering how big the coffee industry has become, it is difficult to determine just how many disposable coffee cups get used annually.

According to the paper industry, Americans will consume an estimated 23 billion paper coffee cups in 2010. A report conducted jointly by the Alliance for Environmental Innovation and Starbucks found that they used 1.9 billion cups in 2000. In 2006, Starbucks reported that this figure had grown to 2.3 billion cups for use at their stores.⁴ Typical paper coffee cups are made from 100% bleached virgin paperboard. Why don't manufacturers use recycled paper? First, FDA regulations are strict when it comes to allowing recycled paper pulp to be in direct contact with food and beverages. Secondly, recycled paper isn't strong enough to hold a liquid. In the late 1990's, Starbucks experimented with a variety of coffee cups made out of recycled paper. Unfortunately, the cups were too flimsy, often resulting in their contents being leaked.⁵ During the manufacturing process, cups are laminated with a plastic resin called polyethylene for keeping beverages warm and preventing the paper from absorbing liquids and leaking. Once in a landfill, the paper will begin to decompose.

Table 2: Figure depict annual consumption statistics and are based on calculations by www.PaperCalculator.org and the Environmental Defense Fund.

	Number of Cups Used	Tons of Wood Consumed	Number of Trees Cut Down	Gallons of Water used
Disposable cups used in the US in 2010	23 Billion	1.4 million	9.4 million	5.7 billion
Disposable cups used in the US in 2006	16 Billion	951 thousand	6.6 million	4 billion
Disposable cups used by Starbucks in 2006	2.3 Billion	137 thousand	944 thousand	569 million

⁴ Starbucks Corporate Social Responsibility Report, 2006. <http://www.starbucks.com/aboutus/csrannualreport.asp>

⁵ CNN Money.com "Creating the Eco-Cup". September 19th, 2006.
http://money.cnn.com/magazines/fortune/fortune_archive/2006/10/02/8387528/index.htm

This process releases methane, a greenhouse gas with 23 times the heat-trapping power of carbon dioxide.⁶ The process involved with manufacturing paper cups is extremely resource intensive. Manufacturing paper requires harvesting trees and using machines to turn the wood into wood chips. The chips are heavily washed to remove any dirt, and then mixed with more water and processed. The resulting paper pulp is dried and the fibers are pressed together to make paper. The entire process requires a substantial amount of water, energy and a lot of trees.

1.3.3 Other researches for sustainable and reusable cups for hot beverage

Even though the problem of paper cup consumption is not a special and particular theme on social issues, people have used a lot of paper cups in their daily life. For example, when the average American adult prepares a party at home and BBQ at the backyard, he or she usually goes to the local grocery store for purchasing disposable forks, spoons, plates and cups. However there are two major ways for avoiding the usage of paper cups, first method being a development of a new material for alternative beverage cups and the latter method a request for customers to use reusable cups. Some other researchers suggested many kinds of alternative beverage cups such as Jelloware cups, Edible cups and Biodegradable cups.



Figure 1: Edible cups by <http://www.thewayweseetheworld.com/>

⁶ Environmental Defense. Starbucks Paper Project Goals and Results. July 20th, 2007.
<http://www.environmentaldefense.org/page.cfm?tagID=2155>

However, most of these great ideas have similar problems requiring big budget and maintenance issues to adjust on practical market situation. In other words, it would be too costly compared to the retail price of each beverage and too weak of a material to keep hot beverage for a long time. My research, thus, will not focus on the different material solution for alternative but will consider solutions for changing the customer's behavior by motivating them to use well-known reusable cups such as ceramic mugs and plastic tumblers.

And there is another good example of reusable cup strategy. In most cases, to go orders require the usage of disposable cups. However, I found a special case in a small local coffee franchise in South Korea. Known as “Coffee Project,” started an extraordinary solution from last year by taking on a project named “Take Around Tumbler” (TAT). Each store prepared one hundred reusable tumblers for customers that ordered coffee to go. The Coffee Project lent a tumbler marked ‘TAT’ to the customers, requesting them to bring it again next time they make a visit.



Figure 2: Symbol and logo of the COFFEE PROJECT / Take around Tumbler

1.3.4 Why do people not use reusable cups?

There are two kinds of customers in the coffee shop, where one type makes an order for enjoying the drink inside the store, whereas the second type orders to go. The first type of customers does not pose a big problem because local coffee shops already use reusable cups in their stores. When they serve customers who want to drink coffee in the store, they serve the ordered beverage in the reusable cups such as mug cups. Ordinary small local coffee stores only try to use the paper cup when the customers want to take the beverage outside. The problem, then, lies in the big global coffee franchise brands such as Starbucks. They served reusable cups to merely 1.5% of customers who ordered a beverage in their coffee shop.⁷ Of course this case was not related to the behaviors of customers; instead, it is usually maintenance problem of the venders. If they are going to serve reusable mug in store, they need to add personnel to wash the cups and so on. So this is another ethical issue of the providers. As of now, the solution presented by Starbucks is developing paper cup material rather than having interest in the behavior of the customers.

1.4 Questions

In this study, I am going to observe the customers who order takeout beverages at local Starbucks in Ames, Iowa, in order to see whether they use their own reusable cups or not. However, the biggest problem on this issue is probably both types of customers using reusable cup or paper cup. While the customers already recognize the harm posed by using paper cups and also realize what they have to do for solving this problem, only a few of them try to put this thought to action. This is why I believe the fundamental solution of this issue is

⁷ Starbucks Corporation, *Starbucks Global Responsibility Report – Goals and Progress*, Starbucks Corporation, 2012, p4

not changing the cup and the material things but changing the customer's behavior. Therefore, I will find the reasons why people do not use their own reusable beverage cup even though they know the problems and solutions about this issue. Secondly, I am going to suggest a reasonable system, which will give motivation to people to use their personal cup with fun and reasonable rewards.

CHAPTER 2. REVIEW OF LITERATURE

Within the last decade, there has been a tremendous flowering of research in behavioral economics, psychology, and persuasive technology. This research helps us understand how people make decisions in their daily lives, and how those decisions are shaped by people's prior experiences and their environment. In order to make people change their behavior, designers must understand how the behavior changes work into the human body. When people decide to change their behavior, it is related to very complex processes such as stimulus, perception, memorize, recognition, motivation, action and so on.⁸ Consequently, this subject relates to numerous theories and methodologies in other variety academic areas. This literature review will introduce about the process of behavior change and a theory that would be well applied in this subject.

2.1 What is Behavior Changing?

Have you ever imagined whether you could control your behavior? Let's imagine that you have the self-control in preventing yourself from doing everything according to your instincts and desires – such as over-eating, drinking alcohol, being late, saying impulsive comments, making rash purchases, unethical behavior, misplacing objects, procrastinating until the last minute and so on. Unfortunately, for the ordinary person it is not easy to change behavior. Behavior changing is not easy even though we strongly wish to do so. In this study, I will thus show some steps and levels of behavior changes.

⁸ Stephen Wendel. (2013). *Designing for Behavior Change*. O'Reilly. page XV



Figure 3: The model of Behavior change flow

For making behavior changes, most people need to know why they need to change their behavior, as well as understand the reasons why they have to get knowledge or experience about the issue. Those knowledge and experiences are based on a learning process. As you can see at above figure number three, I created a description of the flow of behavior changing process, dividing it into three different parts. The first green part is the learning process, the second, the motivation process, and the third, behavior changing.

2.1.1 Learning process

The first step of the behavior change flow is the learning process. What is learning process for human? And how does it work inside us? Basically there are a lot of stimulus and situations, and each stimulus cause people to response their sensory system.⁹ Humans have many kinds of sensory organs such as eyes, nose, skin, ear, tongue and so on. Those are called as the five basic sensory stimuli – visual, auditory, tastes, olfactory and tactile. When a stimulus affects a person, the sensory system of the human body reads the stimulus and conveys the information to the brain. This process is called as a memory. The human brain consists of billions of neurons and these neurons are connected together to form even more billions of different pathways. When people get stimulus from outside environment to their

⁹ Aisen Caro Chacin, (2013). *Sensory Pathways for the Plastic Mind*. Design and Technology Parsons. Page 2-3

sensory system, the human brain records the stimulus on their memory storage area and builds a pathway for the storage. Whenever they have a different experience, another new pathway in the brain will be used. However, we call this kind of storage area and pathway group as short-term memory.

For creating a working pathway, over required stimulus are needed. If one of the experience is repeated, or the stimulus is very strong rather than expected, more nerve impulses are sent along the new pathway. Repetition strengthens the connections between neurons and makes it easier for impulses to travel along the pathway. When people are exposed to repeated stimulus and experience, their brain and body will more easily understand what they need to do next as a feedback. In other words, the human brain can find information that they want to find from all memories because the storage have more pathways to access than simple short-term memory.¹⁰ These storages and pathways into the human brain are called the long-term memory.

Both long-term memory and short-term memory have the ability to store and retrieve information. The effective time of short-term memory is usually about 30 seconds. When you hear a new telephone number and the call time has ended, it is hard to remember the number. This is a reason why this kind of shot-term memory is called volatility memory. If the amount of information that arrives exceeds the capacity for the short-term memory, then some is lost. On the other hand long-term memory may last your whole life. When you sing the words of your favorite song, you are using your long-term memory. Although we often complain about how hard it is to learn new things, there is no limit to how much information you can store in

¹⁰http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_21c/brain_mind/complexrev1.shtml

your long-term memory. Therefore, it is just a matter of how many times you should repeat the new things or how strong stimulus should be affected.

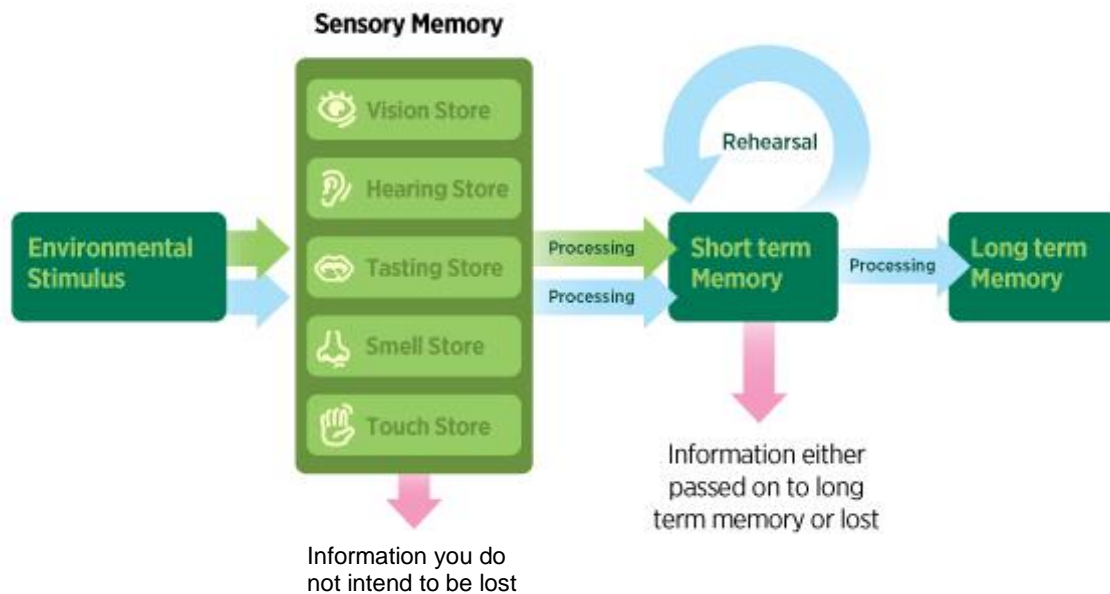


Figure 4: The multi-store memory model

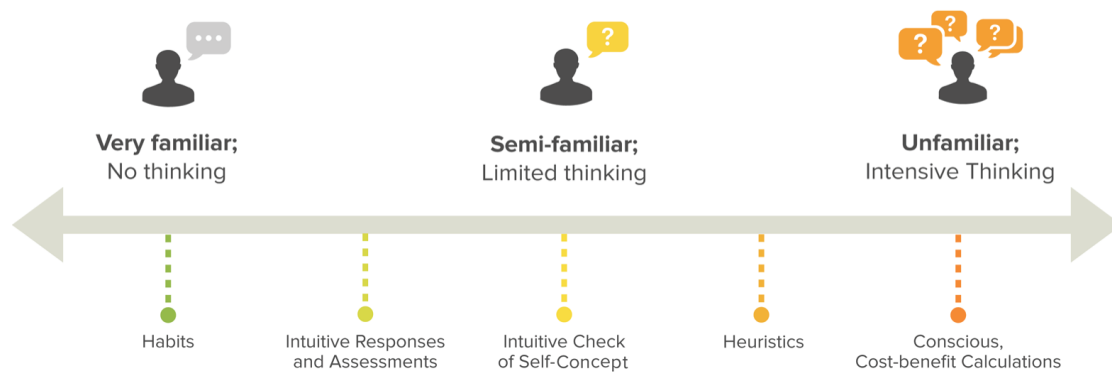
2.1.2 Decision making process

The multi-store memory model can be used to help explain some steps involved in long-term and short-term memory. Next, we are going to find how those memories are related to human behaviors. Human behaviors are basically consisted of a lot of complex steps of decision-making or habits. If there is a command from the brain, the human mind defines whether the command is familiar or not. If the command is very familiar, the human mind does not need to think about it and just executes the action based on its long-term memory. This kind of reaction by very familiar situations and stimulus is called a habit. However, if the command is unfamiliar people try to decide how they should give feedback about the demand, because they don't have any information on long-term storage in their brain.

Table 3: The various tools the mind uses to choose the right action¹¹

MECHANISM	WHERE IT'S MOST LIKELY TO BE USED
Habits	Familiar cues trigger a learned routine
Other intuitive responses	Familiar and semi- familiar situations, with a reaction based on prior experiences
Active mindset or self- concept	Ambiguous situations with a few possible interpretations
Heuristics	Situations where conscious attention is required, but the choice can be implicitly simplified
Focused, conscious calculation	Unfamiliar situations where a conscious choice is required or very important decisions we direct our attention toward

The above table shows how the decision-making system works depending on the familiarity of stimulus. When a person gets any stimulus from outside, the brain checks if is familiar or not. Then the brain tries to find the information from multi memory store, and decides how to react to that.

**Figure 5:** Spectrum of thinking interventions¹²

¹¹ Stephen Wendel. (2013). *Designing for Behavior Change*. O'Reilly. p 150

¹² Stephen Wendel. (2013). *Designing for Behavior Change*. O'Reilly. p 22

According to the result of the decision-making process, people decide to change their behavior or not. When we apply a situation to the behavior change process model, we thus need to consider immediate responses as well as careful responses. The immediate or intuitive response is based on habits from customer's long-term memories, whereas heuristic and conscious response is result on unfamiliar stimulus and situation because it makes people to think and calculate what they need to do as the reactions.

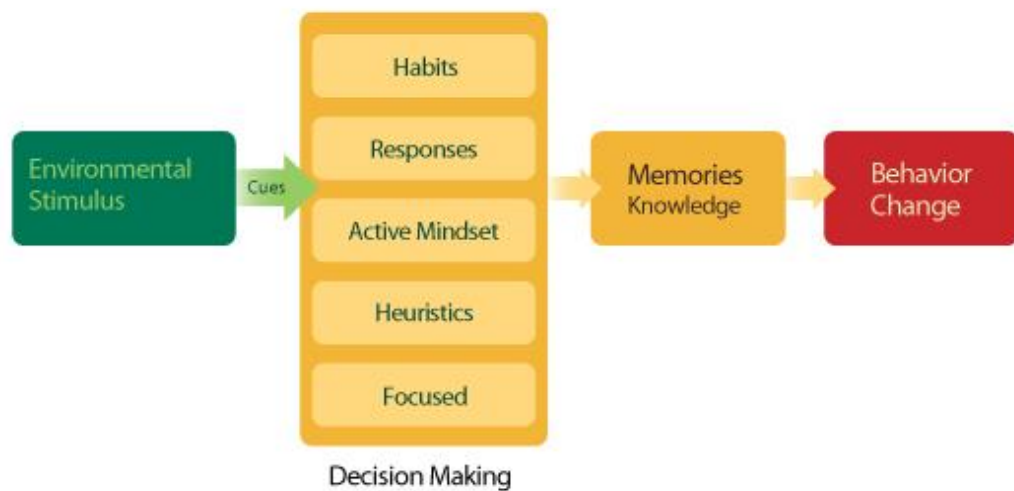


Figure 6: The building behavior change model

2.1.3 Behavior change theories

There are three major theories of Behavior Change, Social Cognitive Theory¹³, Theory of Planned Behavior¹⁴ and Trans theoretical (Stages of Change) Model. Each theory has different perspective and needs depends on behaviors what people want to change. As this regard I chose a theory among three theories on this subject called the ‘Stages of Change’ theory. In order to make a successful behavior change for this subject, it is required to specify

¹³ Bandura, A. (1986). *Social Foundations of Thought and Action*. Englewood Cliffs, New Jersey: Prentice-Hall.

¹⁴ Ajzen, I. (1991). *The Theory of Planned Behavior*. *Organizational Behavior and Human Decision Processes*, 50, 179–211.

and understand each levels of behavior and to find solutions for progressing to the next stage at each independent level.

2.2 Stages of Change Theory

According to the above behavior change process, the biggest problem on this issue is probably that people already know what the problem is and what they have to do in order to solve this problem. Using a personal reusable cup can solve the problem, but just few people try to pass from thought to action. So the fundamental solution of this issue is not changing the cup and the materials but changing the user's behavior. In this research, I will find the reasons why people do not use their own beverage cups even though they know what the problems is and the solutions. I focused on behavior changing methods to find a solution. First, I studied what kind of stages exists for people to change their behavior in the similar case of the problem by literature reviews. Secondly, I applied these findings on the methods and I am going to suggest some solutions on each stages.

2.2.1 The stages of change Theory; TTM model

The Trans theoretical Model of Change¹⁵; a theoretical model of behavior change was introduced by James Prochaska and Carlo DiClemente at the University of Rhode Island when they were studying how smokers were able to give up their habits or addiction. It has been the basis for developing effective interventions to promote health behavior change. The model describes how people modify a problem behavior or acquire a positive behavior. The TTM, Trans theoretical Model of Change, is a model of intentional change. This model focuses on the decision making of the individual.

¹⁵ Prochaska JO , Velicer WF , Rossi JS , et al. (1994) *Stages of change and decisional balance for 12 problem behaviors* . Health Psychology P13

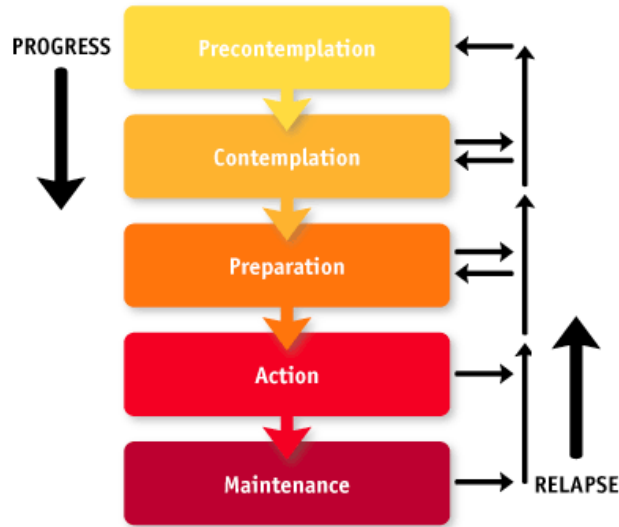


Figure 7: The model of Stages of Change flow

The TTM may help to explain the differences in persons' success during treatment for a range of psychological and physical health problems. This model has been widely applied in behavior modification techniques. As for this research topic, the perception and behavior of the people who use disposable cups did not match like the various studies that apply the TTM model in general. Therefore, it is needed to propose an appropriate solution by separating each step of the Problem Recognition Stage and the Action Stage where practices the solution of the problem.

2.2.2 Each steps of 'Stages of Change'

People pass through a series of stages when change occurs. The stages discussed in their change theory are: ^{16 17}

¹⁶ Prochaska JO, Velicer WF, Rossi JS, et al. (1994) Stages of change and decisional balance for 12 problem behaviors. *Health Psychology* P39 – 46.

¹⁷ The web page of UCLA Centre for Human Nutrition. http://www.cellinteractive.com/ucla/physician_ed/stages_change.html

Stage1. PRECONTEMPLATION _ Not ready to change

The individual is not currently considering change:

- Validate lack of readiness
- Encourage re-evaluation of current behavior
- Encourage self-exploration, not action
- Explain and personalize the risk

Stage2. CONTEMPLATION _ Just thinking of changing

- Encourage evaluation of pros and cons of behavior change.
- Re-evaluation of group image through group activities.
- Identify and promote new, positive outcome expectations

Stage3. PREPARATION _ Ready to change

Some experience with change and are trying to change:

- The individual needs encouragement to evaluate pros and cons of behavior change.
- The therapist needs to identify and promote new, positive outcome expectations in the individual.
- Encourage small initial steps.
- These individuals have taken some actions in the past year such as joining a health education class, consulting a counselor, talking to their physician, buying a self-help book or relying on a self-change approach.
- These groups of individuals are suitable for action- oriented programs for smoking cessation, weight loss, or exercise programs.

Stage4. ACTION _ Making change

The active work toward desired behavioral change including modification of environment, experiences, or behavior has been taken. At this stage people have made specific overt modifications in their life-styles within the past six months and should be taken against relapse.

- Help the individual on restructuring cues and social support.
- Enhance self-efficacy for dealing with obstacles.
- Help to guard against feelings of loss and frustration.

Stage5. MAINTENANCE _ Staying on track

Here, the focus is on ongoing, active work to maintain changes made and relapse prevention. At this stage people are less tempted to relapse and increasingly more confident that they can continue their change.

- Follow-up support
- Reinforce internal rewards
- Discuss coping with relapse

2.3 Case Studies of the Stages of Change Theory

The stage of change theory is also known as the Transtheoretical Model, so it can be called as the abbreviation 'TTM'. This theory introduced the Stages of Change, the dynamic change processes and principles related to each stage in 1980s. In the 1990s, computer-tailored intervention was developed based on the Transtheoretical Model and applying this tailored interventions for

smoking cessation proved effective even when more than 80% were not ready to quit. After this demonstration TTM applied this theory to variety of behaviors beyond smoking cessation. From 2000, TTM-based interventions expanded their research area to simultaneous multiple behavior change and also applied to a wide variety of new behavior change challenges.

2.3.1 Smoking cessation

The stage of change model, expert system intervention was evaluated on 4144 smokers in a two-arm randomized control trial with four follow-ups over 24 months. Smokers were recruited by random digit-dial calls, and 80.0% of the eligible smokers were enrolled. Individualized and interactive expert system computer reports were sent at first, after three and six months. The reports provided feedback on 15 variables relevant for progressing through the stages. The primary outcomes were point prevalence and prolonged abstinence rates. At 24 months, the expert system resulted in 25.6% point prevalence and 12% prolonged abstinence, which were 30% and 56% greater than the control condition. Abstinence rates at each 6-month follow-up were significantly greater in the Expert System condition than in the comparison condition with the absolute difference increasing at each follow-up. A proactive home-based stage-matched expert system smoking cessation program can produce both high participation rates and relatively high abstinence rates.

And multiple studies have found individualized interventions tailored on the 14 TTM variables for smoking cessation to effectively recruit and retain pre-Action participants and produce long-term abstinence rates within the range of 22% – 26%. These interventions have also consistently outperformed alternative interventions including best-in-class action-oriented self-help programs, non-interactive manual-based programs, and other common

interventions.¹⁸ Furthermore, these interventions continued to move pre-Action participants to abstinence even after the program ended. For a summary of smoking cessation clinical outcomes, see Velicer, Redding, Sun, & Prochaska, 2007¹⁹. It is important to note that TTM interventions have a significantly greater impact than other programs because of their ability to: involve a large percentage of the target population (people not ready, getting ready, or ready to change), support high participation rates, achieve strong efficacy rates, produce multiple behavior changes, and use optimal tailoring which minimizes demands on clients and coaches.

For example, out of 1,000 people needing to make a lifestyle change (those in a pre-Action stage), a TTM intervention targets 100% of that population while other programs typically target only the 20% of that population in the Preparation stage. In addition, TTM interventions typically have 70%-80% participation rate with proactive recruitment while other programs typically have a 10% participation rate. Based on the following table, TTM interventions clearly have a more substantial impact than action-oriented programs even when they share the same efficacy rates.

Table 4: Effective of TTM

	Target Population	x	Participation Rate	x	Hypothetical Efficacy	= # of People that Changed Lifestyle
TTM Interventions	1,000 (100%)	x	80%	x	30%	= 240
Other Programs	200 (20%)	x	10%	x	30%	= 30

¹⁸ Prochaska, J. O., DiClemente, C. C., Velicer, W. F., & Rossi, J. S. (1993). Standardized, individualized, interactive, and personalized self-help programs for smoking cessation. *Health Psychology*, 12, 399-405.

¹⁹ Velicer, W. F., Redding, C. A., Sun, X., & Prochaska, J. O. (2007). Demographic variables, smoking variables, and outcome across five studies. *Health Psychology*, 26, 278-287.

As you can see in this example, even with the same efficacy rates, a TTM intervention would have 8 times greater impact on the population than another program.

2.3.2 Losing weight behavior

In the Precontemplation stage, the biggest problem is that people are not thinking seriously about changing and are not interested in receiving any kind of help. People in this stage tend to defend their current bad habits and do not feel it as a problem. They may be defensive in the face of other people's efforts to pressure them to quit.

2.3.3 Other outcomes by the theory

a. Stress management

One of well-known case study subject of TTM was provided Pro-Change's Stress Management intervention. Through the 18-month follow-up, a significantly the sixty-two percent of the treatment group was effectively managing their stress when compared to the control group. The intervention also produced statistically significant reductions in stress and depression and an increase in the use of stress management techniques when compared to the control group.²⁰

b. Adherence to antihypertensive medication

Over 1,000 members of a New England group practice who were prescribed antihypertensive medication participated in Pro-Change's Adherence to Antihypertensive Medication intervention. The vast majority (73%) of the intervention

²⁰ Evers, K. E., Prochaska, J. O., Johnson, J. L., Mauriello, L. M., Padula, J. A., & Prochaska, J. M. (2006). *A randomized clinical trial of a population- and transtheoretical model-based stress-management intervention*. *Health Psychol.*, 25, 521-529.

group who were previously pre-Action were adhering to their prescribed medication regimen at the 12-month follow-up when compared to the control group.²¹

c. Adherence to lipid-lowering drugs

Members of a large New England health plan and various employer groups who were prescribed a cholesterol lowering medication participated in Pro-Change's Adherence to Lipid-Lowering Drugs intervention. More than half of the intervention group (56%) who were previously pre-Action were adhering to their prescribed medication regimen at the 18-month follow-up. Additionally, only 15% of those in the intervention group who were already in Action or Maintenance relapsed into poor medication adherence compared to 45% of the controls. Further, participants who were at risk for physical activity and unhealthy diet were given only stage-based guidance. The treatment group doubled the control group in the percentage in Action or Maintenance at 18 months for physical activity (45%) and diet (25%).²²

d. Depression prevention

Participants were 350 primary care patients experiencing at least mild depression but not involved in a treatment or planning to seek a treatment for depression in the next 30 days. Patients receiving the TTM intervention experienced significantly greater symptom reduction during the 9-month follow-up period. The intervention's largest effects were observed among patients with moderate or severe depression, and who were in the

²¹ Johnson, S. S., Driskell, M. M., Johnson, J. L., Prochaska, J. M., Zwick, W., & Prochaska, J. O. (2006b). *Efficacy of a transtheoretical model-based expert system for antihypertensive adherence*. *Disease Management*, 9, 291-301.

²² Johnson, S. S., Driskell, M. M., Johnson, J. L., Dymont, S. J., Prochaska, J. O., Prochaska, J. M. et al. (2006a). *Transtheoretical model intervention for adherence to lipid-lowering drugs*. *Disease Management*, 9, 102-114.

Precontemplation or Contemplation stage of change at baseline. For example, among patients in the Precontemplation or Contemplation stage, rates of reliable and clinically significant improvement in depression were 40% for treatment and 9% for control.

Among patients with mild depression, or who were in the Action or Maintenance stage at baseline, the intervention helped prevent disease progression to Major Depression during the follow-up period.²³

2.4 Conclusions from the Literature

As discussed above, there have been studies made on behavior changing in diverse areas according to different needs. All the research conducted with behavior changing theories have an aim to discover a solution where human behavior can be changed in a more positive manner. As examined, there are numerous factors that interact and influence each other in the process of determining human behavior. I have thus realized that in order to change human behavior, one must select the most appropriate method after considering the given conditions. This is why I have closely analyzed the Stage of Change theory – which holds the most appropriate condition out of all the behavior changing theory subjects. Focusing on how to apply this particular theory in the future, I will generalize the problem through the various approaches of research method. Furthermore, I will explore design-based solutions according to the theoretical background of each given stage for motivating people to change their behavior positively.

²³ Levesque, D. A., Van Marter, D. F., Schneider, R. J., Bauer, M. R., Goldberg, D. N., Prochaska, J. O., & Prochaska, J.M. (in press). Randomized trial of a computer-tailored intervention for patients with depression. *American Journal of Health Promotion*.

CHAPTER 3. METHODOLOGY

3.1 Analysis of Coffee Consumers

3.1.1 Research objectives

The objective of this research is to find and suggest a possible solution for increasing the consumer rate of using non-disposable cups in the coffee industry and to understand why consumers use disposal cups, particularly paper cups, when they purchase hot beverages. This survey and the interviews can be used to figure out how frequently participants used disposable cups and why they used them. The findings and solutions of this research will serve as an opportunity to worldwide coffee industries to change adverse images, such as using huge quantities of non-environmental products. The research will also motivate people to change their behavior one that is more environmentally friendly. The final outcomes of this research will help consumers to build a more positive experience when they are enjoying beverages. And because this research relevant to human subject, I received an Institutional Review Board approval from the office for Responsible Research. (Appendix A)

3.1.2 Research procedures

a. Survey

The survey participants were recruited via flyer (Appendix B, Attachment 1-1), word of mouth (Appendix B, Attachment 6) and mass email (Appendix B, Attachment 3-1) addressed to Iowa State University faculties, staff, students and my personal contact list. Flyers were posted on the walls of the Iowa State University campus and the word of mouth was also used in the recruitment. All of recruit materials included

the phone number and email address of the principal investigator Interested participants were then asked to email or call the researcher for more information. When I received the replied email from interested participants they had a copy of informed consent as an email for agreement of the informed consent document (Appendix B, Attachment 2-1) by marking a checkbox, and a follow up questionnaire asking, the subject's demographic information, such as age group and gender, will be obtained, as well as a research survey questionnaire enclosed in the email. When the principal investigator met prospective participants directly, the informed consent form was read or explained to the subjects to make sure that the prospective participants understand what they have to do and the importance of the study. If they agreed and didn't have any questions, they were asked to sign the form to the start of the survey questions. (Appendix B, Attachment 7)

b. Interviews

Interview participants also were recruited via flyer and mass email addressed to ISU faculty/staff and students. Flyers (Appendix B, Attachment 1) were posted around the ISU campus. Word of mouth also was used in the recruitment. Interested participants were asked to email the researcher for more information and to schedule a mutually agreeable time. Once I received the reply, a copy of informed consent (Appendix B, Attachment 2) and email script (Appendix B, Attachment 3) was emailed to them. Interviews were done in the local Starbucks on Lincoln Way in Ames and any place in town where it was convenient and safe for both researcher and participants. On the interview day, the introduction script was read and the informed consent form was read or explained to the subject to make sure that they understood what they needed to

do and the importance of the study. If they agreed and didn't have any questions, they were asked to sign the form. Interviews lasted 10 minutes and were done in a convenient location. A follow up questionnaire asking for the subject's demographic information such as age group and gender was obtained. This interview was conducted in private with a researcher to eliminate the influence of peer pressure. The subject's responses were audio-recorded, using digital voice recorders. The audio recordings were then transcribed to analyze the session.

3.1.3 Demographic information of participants

The target demographic for this research is predicated on a number of factors. First, the target customer should be someone who is living in nearby Ames, Iowa. Second, this customer should also be a person who has experience in ordering hot beverages in a local coffee house. Thirdly, for the purposes of this study, the customer should be a person who has an interest about any kind of environmental issues.

Therefore the recommended target demographics for this research is as follows:

- Age group: Adult group age over 18.
- Gender; Male and Female
- Social Life: Residency of participants

This research focused on hot beverage customers rather than providers of hot beverage services. I have one hundred and six participants for this research, ten interviewee and ninety-six survey participants, both of them were recruited via flyer, word of mouth and my personal contact list. I asked three demographic questions to the participants such as

ranges of age, gender and residence distribution. As for those demographic questions, 103 people answered and 3 participants of survey skipped the section and did not answer them.

a. Age groups

As I mentioned above, I have ninety three survey participants who gave answer the survey questions, and designed the age range as four groups; the first age group is twenty generation included eighteen and nineteen years old, the second group is thirty and forty generation, and the third group is fifty and under sixty five and over sixty five years old. Thirty participants were categorized into the first age range, forty-seven people were placed the second group, eleven people were categorized in the third age range, and the last group has five participants. And I have ten interviewees for this research. I kept same age ranges with the survey for compeering each value. However, the first group has three participants, second group has four, and third is two and the last group has only one people.

Table 5: Age range of survey participants, answered: 93 skipped: 3

Answer Choices	Responses (%)	Num. of Responses
18 to 29	32.26	30
30 to 49	50.54	47
50 to 64	11.83	11
65 or older	5.37	5
Total	100	93

b. Gender and residency

The seventy-eight survey candidates can be divided as thirty-five female and forty-three male participants. Among them twenty people lives in North America and the

other fifty-eight people live outside North America. Furthermore, there were six female and four male interviewees, and all of them lived in Ames, Iowa.

Table 6: What is your gender, answered: 93 skipped: 3

Answer Choices	Responses (%)	Num. of Responses
Female	46.24	43
Male	53.76	50
Total	100	93

3.1.4 Results from the survey

According to the result of the survey, nearly seventy-five percent of the respondents drink at least one hot beverage in a week. Furthermore, over eighteen percent purchase a hot drink every day. Based on the result, it can be said that hot beverage consumption at coffee house is not a special culture or trend, but merely a daily life behavior of ordinary people. Furthermore, this statistic information result shows that the target of this market is not narrowed but spreads throughout everyone.

Table 7: Average number of buying beverage each week, answered: 93 skipped: 3

Answer Choices	Responses (%)	Num. of Responses		
		Total	Male	Female
Less than once per week	25.81	24	14	7
1~2	35.48	33	15	18
3~4	20.43	19	11	8
5~6	8.60	8	4	4
More than 6	9.68	9	3	6
Total	100	93	50	43

A question I asked the respondents was whether they are aware of the environment problem of using disposable paper cups. Almost 84% of them answered that they understand using disposable cup would lead to an environmental problem. It can be said, then, that most people are already informed about the environmental damage by consuming disposable cups.

Table 8: Average number of buying beverage each week, answered: 93 skipped: 3

Answer Choices	Responses (%)	Num. of Responses		
		Total	Male	Female
I know	83.87	78	41	37
I do not mind	16.13	15	9	6
Total	100	93	50	43

There is another interesting result from the survey. Even though almost 84% of the respondents were aware of the negative effects in using disposable cups, only 33.33% of them use reusable cups when ordering beverage. According to the result I can formulate a hypothesis such as while the people already recognize the harm posed by using paper cups and also realize what they have to do for solving this problem, only a few of them try to put this thought to action.

Table 9: Result of selection whether participants use reusable cup or not, answered: 93 skipped: 3

Answer Choices	Responses (%)	Num. of Responses		
		T	M	F
if Yes, go to a page of 'Reusable cup users'	33.33	31	13	18
if No, go to a Page of 'Paper-cup users'	66.67	62	37	25
Total	100	93	50	43

From this section, customers can be divided in two categories – ones who use reusable cups regularly, and those that do not. First of all, among the total number of 93 respondents, 31 used reusable cups regularly. According to their responses to the questions, all 31 respondents use various types of reusable cups. In addition, 80% of the 31 respondents stated that their reasons for using reusable cups is for environmental concerns, while 20% stated that it is due to economic reasons. It seems that the principal reward of price reductions provided by coffee brands is not a convincing factor for customers to change their current behavior. As an alternative solution, the environmental effects of reusable cup utilization can be presented to the customers in detail, thereby raising their self-esteem and motivation for such practice.

Table 10: What kind of reusable cup do you have? (Multiple choice),
answered: 31 skipped: 62

Answer Choices	Responses (%)	Num. of Responses		
		Total	Male	Female
Ceramic MUG	45.16	14	8	6
Plastic Tumbler	25.81	8	3	5
Stainless Tumbler	48.39	15	6	9
All of the above	22.58	7	4	3
Total	Multiple choice	44/31		

Table 11: Main reasons for using reusable cups, answered: 31 skipped: 62

Answer Choices	Responses (%)	Num. of Responses		
		Total	Male	Female
Environmental	61.29	19	11	8
Safely	19.35	6	2	4
Economical	22.58	7	3	4
Trendy	16.13	5	2	3
All of the above	16.13	5	3	2
Other (please specify)	19.35	6	4	2
Total	Multiple choice	48/31		

Other opinions

- Less likely to burn your hands
- Keeps my drink warm for longer.
- Keeps my coffee hot for longer.
- Convenient
- Sometimes you get a couple cents discount.
- Keep it warm or cold

I have also identified how often the customers use reusable cups, as well as the inconvenience factors when using them. 75% of the users utilize the reusable cups constantly and have pointed out maintenance reasons, cleanliness, as a factor of inconvenience. As an alternative, there could be a system where reusable cups can be maintained efficiently, or a guideline that helps customers to manage their cups.

Table 12: Frequency of using reusable cups, answered: 31 skipped: 62

Answer Choices	Responses (%)	Num. of Responses		
		Total	Male	Female
Level 1 _ Never Use	0	0	0	0
Level 2 _ Few time	6.45	2	2	0
Level 3 _ From time to time	9.68	3	1	2
Level 4 _ Sometime	48.39	15	7	8
Level 5 _ Always Use	16.13	5	2	3
Other (please specify)	19.35	6	1	5
Average Level Rating	3.83 (Between level 1to level 5)			
Total	100	31	13	18

Table 13: Problems when participants use reusable cup, answered: 31 skipped: 62

Answer Choices	Responses (%)	Num. of Responses		
		Total	Male	Female
Volume and weight	32.26	10	3	7
Maintenance (cleaning cup and so on)	45.16	14	5	9
Appearance	3.22	1	0	1
All of the above	9.68	3	2	1
Other (please specify)	9.68	3	3	0
Total	100	31	13	18

Other opinions

- Not portable.
- Remembering it
- Carrying it around after I'm done so I have it for next time.

When I asked reusable cup users what was the most inconvenient factor of using the cups; over 60% gave maintenance problems as the biggest reason. Finally, current reusable cup users, when inquired about the extent to which their daily lifestyle shows concern on environmental issues, they rated an average of 3.93 on a 5-point scale.

Table 14: How much interest do you have regarding environmental issues, answered: 31 skipped: 62

Answer Choices	Responses (%)	Num. of Responses		
		Total	Male	Female
Level 1 _ Never	0	0	0	0
Level 2 _ Few	9.68	3	1	2
Level 3 _ From time to time	9.68	3	2	1
Level 4 _ Sometime	54.84	17	7	10
Level 5 _ Always	25.80	8	3	5
Average Level Rating	3.93 (Between level 1to level 5)			
Total	100	31	13	18

On the other hand, of the 62 customers who do currently do not use reusable cups, over half of them responded that they are unaware of the economic incentive of using reusable cups; those who knew about the discount showed indifference. So it can be said that the economic incentive is needed but not everything.

Table 15: Did you know that economic incentives are offered to consumers who use a reusable cup?" answered: 62 skipped: 31

Answer Choices	Responses (%)	Num. of Responses		
		Total	Male	Female
Yes	48.39	30	18	12
No	51.61	32	19	13
Total	100	62	37	25

If yes, why you don't use reusable cup even though the incentive:

- It is too small amount incentive.
- Inconvenient at all. Don't like to carry things around.
- There's no other choice
- It is not convenient.
- I don't buy beverages enough.
- The incentive is not beneficial enough for me to trade off convenience.
- Do not want to carry and clean it
- When using public transportation, I do not want to carry a lot of stuff.
- Because I do not go to coffee shop often and I usually go to coffee shop when I meet friends, so it is not easy to bring the reusable cup whenever I go outside.
- Incentive is not high enough to compensate my diligence to carry my own cup, which is reusable all the time, and wash after use.
- Convenience, do not need to carry things around.
- Because it's difficult to do in the drive-through and it's only a few cents discount.
- I just have not purchased them yet.
- Troublesome
- Because I can't be bothered to carry a cup around everywhere I go

- It seems not much relatively because it's not easy to bring my cup everyday and it spends the time and money to manage and buy the reusable one.
- It is inconvenient to carry one around.

Table 16: What are your main reasons for not carrying a reusable cup?
(Multiple choice), answered: 62 skipped: 31

Answer Choices	Responses (%)	Num. of Responses		
		Total	Male	Female
Didn't buy hot beverages often enough to use own cup	30.30	30	16	14
Inconvenience	41.41	41	12	29
Not aware of the economic incentives	15.15	15	6	9
Lack of interest in environmental issues	8.08	8	4	4
Other (please specify)	5.05	5	3	2
Total Respondents	Multiple choice	99/62		

Other opinions

- Not only am I not used to carrying a reusable cup with me, I worry that the coffee shops will not accept it.
- I am timid to inquire about it. It will be better if the coffee shop has more promotion or advertisements about it.
- I usually forget it if I have too many things to carry. There are also times where I didn't plan to drink outside beforehand, but end up going to a coffee shop by chance.
- I do not know w which coffee shop I will go when leaving home. (Some coffee shops here in Japan offer discount to reusable cup users, but most coffee shops do not or at least I am not aware.)
- Carrying around is a hassle

And the biggest part of the non-users responded inconvenience told the main reason why they do not want to use the reusable cups. Over 90% of respondents stated that if they did not carry reusable cups, it would be the problems of volume and weight of the cups, and maintenance problem. Especially the volume and weight was regarded by women participants, and maintenance is issued by men responses. Another finding is both of men and women does not mind the appearance of reusable cup.

Table 17: Which one is the most inconvenient value when you carrying a reusable cup, answered: 62 skipped: 31

Answer Choices	Responses (%)	Num. of Responses		
		Total	Male	Female
Volume and weight	46.77	29	14	15
Maintenance (cleaning cup and so on)	37.10	23	17	6
Appearance	0	0	0	0
All of the above	11.29	7	4	3
Other (please specify)	4.84	3	2	1
Total Respondents	100	62	37	25

Other opinions

- I agree that there are those reasons mentioned above, but I usually drink coffee after a meal or when taking a rest while outside, so I don't have a reusable cup with me all the time. It's not like a planned shopping.
- I've had times where the inner contents leaked out of the reusable cups.
- Price/remembering to take the reusable cup.

The last two questions asked the respondents which type of reusable cup they would use if they decided to use it regularly; the majority – 36 out of 44 respondents – replied they would use one made of stainless steel material, giving safety and economic issues as the main reasons.

Table 18: If you decide to use a reusable cup, what kind of reusable cup do you select, answered: 62 skipped: 31

Answer Choices	Responses (%)	Num. of Responses		
		Total	Male	Female
Ceramic MUG	8.06	5	2	3
Plastic Tumbler	11.29	7	6	1
Stainless Tumbler	74.20	46	26	20
All of the above	6.45	4	3	1
Other (please specify)	0	0	0	0
Total Respondents	100	62	37	25

Table 19: What are your main reasons to select the reusable cup? (Multiple choice), answered: 62 skipped: 31

Answer Choices	Responses (%)	Num. of Responses		
		Total	Male	Female
Safety	27.42	17	9	8
Economic	24.19	15	9	6
Trendy	17.74	11	5	6
All of the above	4.84	3	3	0
Other (please specify)	25.81	16	11	5
Total Respondents	100	62	37	25

Other opinions

- I feel good when I drink from fancy cups. Paper cups are easy to leak and spill. After having a baby, I try to not use paper cups.
- Design
- The economic benefit is not clear at the moment, but if there is, I will be motivated.
- I understand that paper cups are not only environmentally hazardous, but they also have negative health effects. Therefore, I've tried many times but was not successful.
- I'm not sure if stainless steel cups are easier to wash and clean, but it seems that they are cleaner and easier to maintain than plastic cups.
- Weight
- No matter how, I think to use the paper cup is too wasteful.
- And environmental awareness. Want to protect the earth.
- Make a statement with its design and also I can choose the size more easily.
- I don't have to think ahead to bring one. Since I don't go that often I don't think about it in advance.
- Disposable waste has been increased in a tremendous way. The environment must be regarded as very important for the future generation.

Furthermore, the majority of the non-users responded inconvenience was the main reason for not using reusable cups – such as the size and weight of the cups, washing and maintenance problems. Most respondents stated that if they do use reusable cups, it would be preferable to use a light, stainless steel tumbler that easy to manage.

3.1.5 Results from the interview

In order to further observe details based on the survey questions, the interview was carried out in a Starbucks store located in downtown Ames, Iowa. The most interesting

observation made was that most reusable cup users took great pride in their efforts of helping the environment. They stated that although inconvenient at first, once one is used to carrying his or her own cup to the store, it no longer becomes a hassle. Furthermore, the majority of reusable cup users were involved in various other environmental activities. Non-users stated that although they have a will to use reusable cups, the inconvenience of washing them regularly and other sanitary issues were posed as barriers. Several respondents stated that in the past, they have tried using ceramic mug cups that were relatively easy to wash, but because the mugs were so easily broken, they used plastic or stainless tumblers. However, due to the reason that it was difficult to wash the lids and the insides of the tumblers, they reverted back to using paper cups provided at the coffee shops.

3.1.6 Conclusions from the analysis

Through the conducted surveys and interviews, I was able to recognize a variety of opinions regarding the usage of reusable of cups. It is apparent that respondents who use reusable cups basically have a concern for environmental issues, as well as non-users who are at least aware of the problem. For many reasons, however, customers are unable to put their thoughts into action despite the fact that they know how to act in a socially responsible way.

Furthermore, stainless steel tumblers appear to be the most preferable form of reusable cups for potential users. Essentially, they must be presented with a plan which addresses the maintenance and washing inconveniences.

3.2 Research of Environment Strategy for Existing Beverage Brands

3.2.1 Research of Starbucks

a. Market geographic of global Starbucks

According to a report of 'Starbucks; Delivering customer service' from 2002,²⁴ it shows that in the Southeastern part of the United States there was only one store for every 110,000 people, whereas in the Pacific Northwest, there was one store for every 20,000 people. Hence, the company was far from reaching existing markets. As for global coffee markets, international plans showed that Starbucks was operating in over 300 company-owned stores in the United Kingdom, Australia, and Thailand. Furthermore, 900 licensed stores were operating in Asia, Europe, the Middle East, Africa, and Latin America.

b. Demographics of main customers

A 1999 estimate showed that 70% of customers were internet users, and today the numbers have risen, exceeding 90%.²⁵ Whereas customers that visit coffee shops most frequently make an average of 18 visits per month, the typical customer visits five times per month. The average age for an established customer was 40, while for new customers the average of 36 years old. In addition, 45% of the customers who started making visits to Starbucks in 2002 were female, whereas 55% were male.

²⁴ Moon, Youngme, and John Quelch. *Starbucks: Delivering Customer Service*. Harvard, College. Boston: Harvard Business School, 2003. 1-20.

²⁵ "Starbucks Corporation." Hoovers, Inc. 2006. 4 Dec. 2006.

c. Feature of Starbucks in coffee market

In response to market needs²⁶, Starbucks wishes to create an experience which integrates the customers' tight and busy schedule, as well as a place where one is able to relax. Christine Day, the senior vice president of administration in North America, explains that, "people come here for the coffee, but ambience is what makes them want to stay" So when they want to stay and enjoy their time in local Starbucks shop, customers are able to select a wide selection of the Starbucks menu, which includes brewed coffee, espresso traditions and favorites, cold beverages, coffee alternatives, Frappuccino, and the sale of whole beans. Not only menu selection but also Starbucks provides easy accessibility to their customers, operating over 10,000 retail stores. Most of the 4,200 franchised stores are located in shopping malls and airports, where customers of all ages are able to access freely. And Starbucks coffee brands are marketed through grocery stores in the form of beans as well as ice cream flavors.

The employment method of Starbucks is closely connected to their manner of customer service. For instance, Starbucks employees are referred to as "partners." As of 2002, Starbucks employed approximately 60,000 partners around the globe, out of which 50,000 were those in the United States. In taking over Starbucks, Howard Schultz, now the chairman and CEO of Starbucks, stated, "Partner satisfaction leads to customer satisfaction"

²⁶ Moon, Youngme, and John Quelch. *Starbucks: Delivering Customer Service*. Harvard, College. Boston: Harvard Business School, 2003. 1-20.

And another strength of this brand is Starbucks also provides competitive pricing for their customers. In the 2002 fiscal year, the average price of an order in North American stores was \$3.85. The drinks come in three sizes: tall, grande, and venti (Italian for small, medium, and large). The least expensive price for a tall drink is \$1.40 for brewed Coffee of the Day. The most expensive price for a venti is \$4.15 for Frappuccino. Whole beans are sold in half and whole pound bags ranging from \$5.20 to \$15.95.

Table 20: Total U.S. retail coffee market (both in-home and out-of-home consumption)

	Year of 2002	Year of 2005
Specialty Coffee Market	42%	50%
Traditional Coffee	73%	69%
Specialty Coffee	27%	31%
Estimate(billion dollar)	21.5	22

Over the next few years, an estimate for the U.S. retail coffee market expects specialty coffee to have a compound annual growth rate (CAGR) between 9%-10%. Starbucks was also estimated in 2002 to grow at a CAGR of about 20% top-line revenue growth. As of 2002, coffee consumption had risen with more than half of the population (about 109 million people) drinking coffee everyday, and an additional 52 million drinking coffee on occasion. Reports show that in 2002, the number of specialty coffee drinkers has become the Starbucks market's biggest growth. An

estimated one-third of all U.S. coffee consumption takes place outside of the home and in places such as offices, restaurants, and coffee shops.²⁷

3.2.2 Problem statement of Starbucks

Because recycling infrastructure varies widely amongst countries around the world – even from one city to another – a one size-fits-all approach does not work for a global business such as Starbucks with stores in more than 60 countries. Starbucks has proven that used cups can be accepted in a variety of recycling systems, and it is bringing this to scale in the United States, Canada, the United Kingdom and Germany. While developing material and infrastructure solutions in additional markets, Starbucks is working toward its goal to provide all customers access to cup recycling by 2015. By working with nongovernmental organizations, policy makers, competitors and others, Starbucks is able to tackle common challenges. As a member of the Paper Recovery Alliance and the Plastics Recovery Alliance, and others, Starbucks is helping advance a number of meaningful food packaging initiatives that will have a significant impact on the entire industry. Although most customers who visit Coffee Project take their beverages to go, providing front-of-store recycling is an important part of the company's effort to develop comprehensive recycling solutions. In 2008 Starbucks set a goal to implement front-of-store recycling in all company-owned locations by 2015. In 2012 24% of its company-owned stores in the United States and Canada offered front-of-store recycling. Of these locations, 94% were able to recycle or compost the hot cup. Starbucks is currently expanding to international markets to reach its goal.

²⁷ Moon, Youngme, and John Quelch. *Starbucks: Delivering Customer Service*. Harvard, College. Boston: Harvard Business School, 2003. 1-20.

GOAL

Implement front-of-store recycling in our company-operated stores by 2015

PROGRESS

Although we are pleased that 67% more company-operated stores in the U.S. and Canada offered front-of-store recycling over the prior year, we have struggled to implement this single solution in local markets across the entire Starbucks portfolio. While we work to increase front-of-store recycling, we will also explore new ways to lower our impact.

NEEDS IMPROVEMENT



Figure 8. Goal and progress for recycling in stores ²⁸

In 2012 Starbucks confirmed that markets such as Germany and the United Kingdom have effective recycling solutions in place, even if they do not include front-of-store recycling canisters. For example, in the United Kingdom store waste is separated into three streams in the back of the Starbucks stores, and then separated later at the waste facility. Its UK stores are currently diverting approximately 50% of their waste from landfills with this method, and Starbucks is continually testing ways to increase this percentage. By leveraging the solutions from its different markets around the world, Starbucks is able to help build capabilities in markets newer to recycling.

Back-of-store recycling is also a priority, as most of the in-store waste is generated behind the counter. In 2012 78% of the 3,178 stores in the United States and Canada where Starbucks is responsible for providing waste removal services recycled cardboard boxes and other items. Among Starbucks's remaining U.S. and Canada retail locations, the majority were limited by operational impediments, such as a lack of store space for recycling carts or the

²⁸ Starbucks Corporation: *Starbucks Global Responsibility Report- Goals and Progress 2013*. Starbucks, 2013. P16.

unavailability of commercial recycling services. Starbucks is currently working to resolve these barriers.

Reusable cups are an important component of Starbucks's overall waste reduction strategy. Since 1985 this coffee franchise business has rewarded its customers with a discount when they bring in personal tumblers; Starbucks's goal is to serve 5% of the beverages made in its stores in tumblers and mugs brought in by the customers.



Figure 9. Goal and progress of reducing waste with reusable cups ²⁹

In 2012 customers brought their own tumblers into Starbucks's stores 35.8 million times, saving more than 1.6 million pounds of paper from landfills. Although customers brought in their personal mugs 1.6 million more times in 2012 over the previous year, the percentage of customers choosing reusable mugs remained flat from last year.

To sum up, according to the report mentioned above, Starbucks is pursuing a variety of eco-friendly projects, and a number of indicators show that the company is

²⁹ Starbucks Corporation: *Starbucks Global Responsibility Report- Goals and Progress 2013*. Starbucks, 2013. P17.

approaching their goals. However, it appears that the only one area of difficulty they face is in the reduction of paper cup usage. This is due to the fact that it requires not only the efforts of Starbucks, but also their customers' participation. It is not an easy task to change customer's behavior and many of the survey results and research confine this. Therefore, from this point on, we will observe how the Stage of Change theory can be applied to Starbucks, and how it can be used to effectively change customer behavior in each stage.

3.2.3 Apply the Stages of Change theory for Starbucks

a. Stages one; Precontemplation

In the precontemplation stage, the biggest problem is that individuals do not think seriously about changing their behavior, and thus are not interested in receiving any kind of help. Those in this stage tend to defend their current negative habits and do not feel it is a problem. They may be defensive in the face of other people's efforts to pressure them to quit.

Table 21. Precontemplation; not ready to change

Problems of the model	Problems of the paper cup	Requirements to change
Lack of readiness	Too big data	Simplify the messages
Re-evaluation of current behavior	Connivance	Giving reasonable cues
Encourage themselves	Ignore the problem	Giving reasonable cues
Explain the risk	NIMBI	Support data of the fact

b. Stage two: Contemplation

In the contemplation stage individuals are more aware of the personal consequences of their negative habit and spend time thinking about their problem. Although they are able to consider the possibility of changing, they tend to be ambivalent about it. In this stage, one is on a teeter-totter, weighing the pros and cons of quitting or modifying his or her behavior. Individuals may consider the negative aspects of their negative habit and the potentially positive results of giving the behavior up or reducing it, but there may nonetheless be a doubt that the long-term benefits associated with quitting will outweigh the short-term costs. It might take as little as a couple weeks or as long as a lifetime to get through the contemplation stage. On the plus side, people are more open to receiving information about their negative habit, and more likely to actually use educational interventions and reflect on their own feelings and thoughts concerning it.

Table 22, Contemplation; just thinking of changing

Problems of the model	Problems of the paper cup	Requirements to change
Evaluation of Pros & Cons	Size matter of reusable cup	Minimum or changeable size
	Weight of reusable cup	Using light material
Positive outcome expectation	Cleaning up maintenance	Easy maintenance
	Appearance	Designed product

c. Stage three: Preparation/Determination

In the preparation/determination stage, the person has made a commitment to make a change. This is sort of a research phase: individuals are now taking small steps

toward cessation. They will try to gather information about what they will need to do to change their behavior, or call various clinics, trying to find out what strategies and resources are available to help them in their attempt. Too often, people skip this stage: they try to move directly from contemplation into action and fall flat on their faces because they haven't adequately researched or accepted what it is going to take to make this major lifestyle change.

Table 23. The preparation/determination stage; ready to change

Problems of the model	Problems of the paper cup	Requirements to change
Need to identify	Lack of feedback	Customize individuals
Past experiences	Nothing specials	Interesting features
Action oriented program	Too small changes	Promote positive outcome
Encourage each change		The cumulative data

d. Stage four: Action/Willpower

This is the stage where the person believes he or she has the ability to change the negative behavior and is involved in taking steps to change it by using a variety of different techniques. This is the shortest of all the stages. The amount of time each person generally spends in action varies. It generally lasts about 6 months, but it can literally be as short as one hour! This is a stage when one depends most on his or her willpower.³⁰

³⁰ Prochaska JO, Velicer WF, Rossi JS, et al. (1994) Stages of change and decisional balance for 12 problem behaviors. *Health Psychology* P39 – 46.

Table 24. The action and willpower; making change

Problems of the model	Problems of the paper cup	Requirements to change
Pride	Invisible change	Motivation
Self-efficacy	Inconvenient	Convenience in use
Stress and depress	Forget or hard to carry reusable cup	Portability

While making overt efforts to quit or change the behavior, one is at the greatest risk for relapse. Individuals mentally review their commitment to themselves and develop plans to deal with both personal and external pressures that may lead to slips. In order to sustain their motivation, short-term rewards may be used, and behavior change efforts may be analyzed in a way that enhances self-confidence. Those in this stage also tend to be open to receiving help and are likely to seek support from others.

e. Stage five: Maintenance

Maintenance involves being able to successfully avoid any temptations that may lead one to return to the bad habit. The goal of the maintenance stage is to maintain the new status quo. Those in this stage tend to remind themselves of how much progress they have made. Constantly reformulating the rules of their lives, they acquire new skills to deal with life and avoid relapse. People in the maintenance stage are also able to anticipate the situations in which a relapse may occur and prepare coping strategies in advance. Furthermore, they remain aware that what they are striving for is personally worthwhile and meaningful. They are also patient with themselves and recognize that it

often takes a while to let go of old behavior patterns, practicing new ones until becoming second nature to them.

Table 25. The maintenance; staying on track

Problems of the model	Problems of the paper cup	Requirements to change
Follow-up support	Less tempted	Sustainable stimulus
Reinforce reward	Boring	Variety rewards
Relapse	Ignore importance	Remind

3.3 Design Solutions for Each Stage

3.3.1 Solution for stages of Pre-contemplation; Information graphic design

As mentioned earlier, the greatest problem in this stage is that consumers need an accurate awareness of the environmental damages that can result from paper cup usage. In order to deliver accurate information such as statistics, one must use an information design that consumers can understand and remember well. More formally, an infographic is defined as a visualization of data or ideas that tries to convey complex information to an audience in a manner that can be quickly consumed and easily understood. The process of developing and publishing infographics is called data visualization, information design, or information architecture.³¹

³¹ Mark Smiciklas . *The Power of Infographics: Using Pictures to Communicate and Connect with Your Audience*. Pearson education, Inc. P3

Table 26. Design solutions for the first stage

Problems of the model	Problems of the paper cup	Requirements to change	Design solutions
Lack of readiness	Too big data	Simplify the messages	Information Graphic or movie about the issue
Re-evaluation of current behavior	Connivance	Giving reasonable cues	
Encourage themselves	Ignore the problem	Giving reasonable cues	
Explain the risk	NIMBI	Support data of the fact	

3.3.2 Solution for stages of Contemplation; Eco friendly reusable cup design

In this stage, consumers already have a good understanding of the problem on what they should change their behavior. Based on this understanding, one of the key factors that can help the users' have substantial behavior is ensuring directly or indirectly that they are people who have interest in environmental issues by themselves. Therefore, I propose a new Reusable Cup in the stage. In this environment of study, the most common way to show the users 'tendency and interest is a portable Reusable cup. In finding an alternative solution, it has been noted through surveys and interviews that the majority of the respondents prefer stainless steel tumblers (Table 10) as reusable cups. Furthermore, these reusable cups must be portable, easy to carry, and requires an easy maintenance. As for the type of preferred design, the respondents expressed that it must present an environmentally friendly image, rather than appear fancy and colorful.

Table 27. Design solutions for the second stage

Problems of the model	Problems of the paper cup	Requirements to change	Design solutions
Evaluation of Pros & Cons	Size matter of reusable cup	Minimum or changeable size	Plastic or aluminum tumbler
	Weight of reusable cup	Using light material	
Positive expectation	Cleaning up maintenance	Easy maintenance	Support cleaning into the shop
	Appearance	Designed product	Eco friendly design Timeless style tumbler design

3.3.3 Solution for stages of Preparation for Action; User interface design

The third stage, Preparation for Action, is easy to be overlooked in many cases. However, if this preparation stage is indefinite, it will be hard to see effective and long-term behavior change in the next Stages of Action. In the case of Starbucks, the company must move away from simply requesting customers to use reusable cups. Instead, for active intervention, I redesign a new mobile device application service based on the existing Starbucks App platform in smart phones, and thereby continually provide motivation factors for the customers. Thus, by focusing on individual mobile devices, one should build a simple and clear Interface Design.

Table 28. Design solutions for the third stage

Problems of the model	Problems of the paper cup	Requirements to change	Design solutions
Need to identify	Lack of feedback	Customize individuals	App for Personal device
Past experiences	Nothing specials	Interesting features	Visualize User Interface
Action oriented program	Too small change	Promote positive outcome	Reward system design
Encourage each change		The cumulative data	

3.3.4 Solution for stages of Action; Brand and service design

The fourth Action Stage is where the users directly take actions using their knowledge and decisions they have built until now. It is easy for the users to enter this stage for they have already decided to change their thoughts to action. But the problem is that the moment they take practical action the substantial resistance also appears with it. As an example, the users can take the reusable cup on their own volition, but would experience inconvenience. Also, they will meet an unfamiliar experience like when it is your first time ordering with the reusable cup and other differences that come up through these changes. In this stage, it is important to take direct action but it is necessary to provide something more valuable to the users that can predict these resistances and minimize or remove the resistance. Therefore, by proposing a brand and other various promotions for this stage, through sharing

a brand value that the users can trust and with interesting promotions, a continuous act can become their individual pride.

Table 29. Design solutions for the fourth stage

Problems of the model	Problems of the paper cup	Requirements to change	Design solutions
Pride	Invisible change	Motivation	Brand design and other application
Self-efficacy	Inconvenient	Convenience in use	Creating fun and exciting value
Stress and depress	Forget or hard to carry reusable cup	Portability	Attractive appearance

3.3.5 Solution for stages of Maintenance; Infographic and entertainment design

In the last stage 'Maintenance', it is important how the users overcome their boredom of their repeated actions that they decided to do. In this stage, the Design Solution helps the users to sense directly how much difference their actions changed by quantifying their actions and showing them again. Also this should entertain the users with games or promotions that will not make them feel bored but make them feel they have done something valuable. In this study, we can develop a game that uses a tumbler and the game will have a reward system so that the users can get many different kinds of benefits through the game. Besides, by developing various types of game tools, users can sustainably use the tumbler.

Table 30. Design solutions for the last stage

Problems of the model	Problems of the paper cup	Requirements to change	Design solutions
Follow-up support	Less tempted	Sustainable stimulus	Diversify games
Reinforce reward	Boring	Variety rewards	Create promotion events
Relapse	Ignore importance	Remind	Clarify feed back

3.4 Design System for Sustainable Package: Green Number Project

Through the presented issues and the solution for those issues, I am proposing a new system that uses a newly designed reusable tumbler based on a new reward system. The problem of paper cup usage can be addressed by finding a design system for sustainable package that will present the customers with practical and persuasive motivation factors. It called as Green Number Project.

3.4.1 Information graphic design

As regarding the design solution from the first stage, I tried to design an information graphic poster that clearly shows the meaning of the rather high numbers. According to a previously stated data in 2006, Starbucks consumed 2.3 billion numbers of disposable cups worldwide. In order to produce this amount of paper cups, the paper cup industry needs to cut down 944 thousand numbers of trees. A paper authored by David B. South³² (Professor School of Forestry and Wildlife Sciences and Alabama Agricultural Experiment Station

³² South, David B. - "Planting longleaf pine at wide spacings", Native Plants Journal - Volume 7, Num1, Spring 2006, pp. 79-88

Auburn University, AL), it states that a typical 10-year-old Southern Pine might have a diameter at breast height of 10 in and height of 53.5 ft. According to the Journal of Construction Education, a standard American house of 1,500 square foot, 3-bedroom, one-story gable house with slab-on-grade foundation in Florida takes about 400 board feet of lumber.³³ As a Lumber timber calculator, using the above Southern Pine, we would get about 75 board feet (using the International Rule) per a tree. It would thus take around 5.3 of these trees to build the house described above. This means that with the number of yearly consumed paper cups in Starbucks Coffee 178 thousand American standard-size houses can be built, which nearly equals the number of housing units in Minneapolis, Minnesota in 2012.³⁴



Figure 10. Information graphic about paper cup consumption, designed by Joongsup Lee, 2012

³³ Journal of Construction Education: <http://forestry.about.com/cs/forestvalua...> and <http://www.ascjournal.ascweb.org/journal...>

³⁴ 2012 house hold numbers @ www.census.gov

3.4.2 Eco friendly reusable cup design

To begin with, coffee shops must reduce any discomfort that the customers may feel in using reusable cups. As mentioned in the survey results above, the greatest barrier for the customers was difficulty of maintenance. Non-users have also expressed that lightweight stainless steel tumblers would be the most preferable kind of reusable cup that may be used. Therefore, by providing an adequate washing facility or equipment for washing stainless steel tumblers, coffee businesses will be able to address the problem of maintenance for both current reusable cup users and non-users.



Figure 11. Tumbler design for Green Number project, designed by Joongsup Lee, 2012

Specifically, high-pressure machines designed to wash tumblers will grant customers a quick and easy way to clean out the contents inside. Staff members may either help the customers to wash their tumblers by using the high-pressure machinery, or may even allow

the customers to use the equipment themselves. Thus, when visiting the stores, customers can bring their reusable cups unwashed, and easily access a machine that will do the cleaning for them, ultimately removing any inconvenience related to maintenance issues.

Following the maintenance process above, is another important solution in the designers' perspective, "Eco Friendly Reusable Cup Design". The design you see in Figure 11 is designed in two forms, a small sized tumbler and a big one. The small sized tumbler minimizes the pollution using soy ink on recycled paper and prints in one color. And the large tumbler uses the same recycled paper with no ink but displays information with paper cutting, adopting a more eco-friendly manufacturing method. Also the pouch that keeps the tumbler does an important role to complete an Eco Friendly Reusable Cup, which is made of worn hoodies or shirts that are abandoned in houses.

3.4.3 User interface design

In order for an individual to move away from a negative habit to a new one, one must have the adequate motivation to do so. In this case, two kinds of motivation may be given to the customers – enjoyment and a sense of pride. This can be done by creating a system that integrates both package design and smart-phone application.

First of all, the reusable cups that customers bring will be randomly marked with any number between 0 and 9. The customers will then be able to play a game through their smart-phones or even online, where each person will ultimately end up with a digit between 0 and 9. If the individual receives the same number that is marked on his or her tumbler, then the application will send a coupon allowing for one free drink. Customers that play the game but do not end up with the same digit will nonetheless have received a monetary benefit of

discount for using reusable cups. Therefore, whether or not the customers win or lose, there will be a motivation factor of enjoyment by playing the game. When it's a busy hour it will be hard to do a game because of the waiting line. Therefore the customers that bought a beverage with the Green Number Tumbler can get the same reward by receiving a game coupon through the mobile application and accessing the game with the QR code on the tumbler. For those customers that do not use smart-phones, offline games may be provided in the store. For example, customers who brought their tumblers will be given a chance to throw darts at a target, where each area of the target will be marked a specific digit.



Figure 12. QR code on the Green Number tumbler, designed by Joongsup Lee

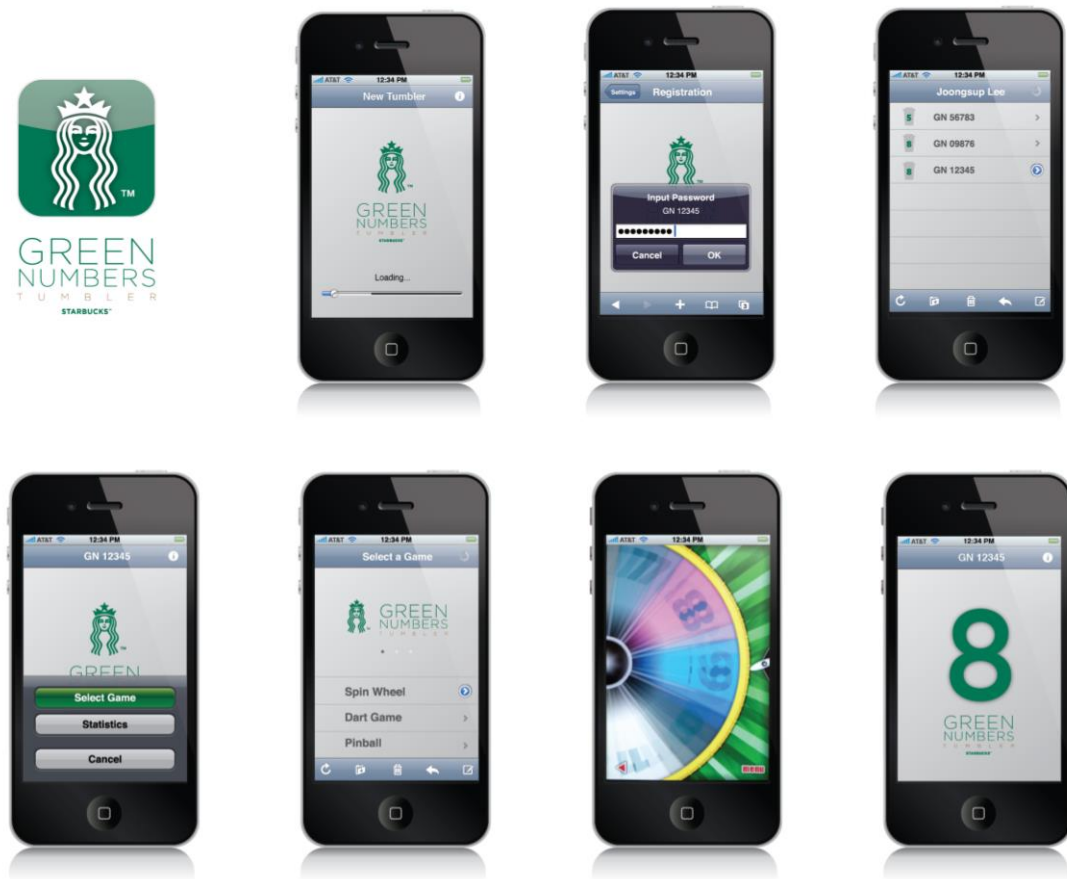


Figure 13. User interface design for Green Number App, designed by Joongsup Lee

3.4.4 Brand and service design

The stage above presents a physical pollution to provide the information and system to change the user's behavior. Starting from this stage qualitative things that the consumer feels, thinks, and enjoys will become the key design elements. Although this kind of solution could be hard to carry around, it is necessary to give them the pride to the continuous reusable cup users and make sure they feel confident that they are doing the right

thing. For that reason, the brand for 'Green Number Tumbler' was design separately and I expect the products and service that are applied with the design will provide a more active pride and solidarity to the consumers.



Figure 14. Brand design for Green Number App, designed by Joongsup Lee

This brand design uses the Siren Design on the original Starbucks Symbol and is redesigned into a tumbler form. This can sustain the value of the original brand, but also have an identity as an independent campaign. Also, in order to sustain the service you can develop a game. The game where you can choose variety shapes of 0 to 9 is designed so that the user does not get bored and has different kinds of promotions regarding numbers. For example, in Independents day number 7 and 4 get a bonus point. Or the consumers can get a special present if they bring the numbered tumbler in within the month of their birthday. A tumbler gift set can be made for birthdays and anniversaries. This holistic design approach will continually give motivation to use tumblers. However more types of plans are required.

3.4.5 Information and experience design

Another motivation factor that can be given to the customers is a sense of pride in using reusable cups. This will also be done by a smart-phone application. Whenever a customer brings a reusable cup to the store, the staff will register data that the customer has saved one paper cup. As the number of paper cups increase each time the customer uses a reusable cup, he or she can immediately check how many trees were saved. By such visible, realistic record, the customer will grow a sense of pride in using reusable cups instead of paper cups.



Figure 15. Providing prompt feedback system, designed by Joongsup Lee

This kind of prompt and tangible feedback makes the customers participate actively. Also these information and experiences can be used as a tool in creating a new and positive behavioral change.

CHAPTER 4. CONCLUSIONS AND IMPLICATIONS

This research was carried out in order to find some reasonable solutions for reducing the waste in order to increase sustainability. After recognizing that one of the greatest concerns for coffee industries is the environmental problem caused by mass paper cup usage in coffee shops, I have researched ways in which it may be addressed. In order to observe the problem in detail, I focused on how the alternative solution – increasing the customers' reusable cup usage – may be achieved, specifically by behavior change with motivation. With this approach, I have presented several solutions which integrate customer motivation and package design. In observing the environmental problem posed by paper cup consumption, this project looked at a globally branded coffee shop, Starbucks. Being one of the largest coffee franchise businesses, Starbucks already had interest in the paper cup problem, trying numerous ways in which the situation may be solved. However, it appears that their efforts are on a standstill, and other solutions are in need. When carrying out the research, I tried to define why customers, who are aware of the environmental problem of using paper cups, are not able to act according to the way they think. By studying various literature reviews, I was able to acquire a broad perspective of the behavior motivation and the steps required to make a behavior change.

By surveying and interviewing some hot beverage purchasers at the local Starbucks in Ames, Iowa, I was able to understand the perception of customers about using reusable cups and paper cups. The results of the surveys and interviews conducted at the local Starbucks store showed that both types of customers – reusable cup users and paper cup users - basically have a concern for environmental issues. In fact, while most reusable cup users have great pride in their efforts of helping the environment, non-users stated that although they have a will to use reusable cups, the

inconvenience of washing them regularly and other maintenance issues prevented them to do so. If non-users were to use reusable cups, however, stainless steel tumblers were expressed as the most preferable form of reusable cups. From these observations, I recognized that both users and non-users of reusable cups must be presented with a plan which addresses the maintenance and washing inconveniences. By finding a design system for sustainable package, the customers will be provided with persuasive factors that will motivate them to use reusable cups rather than paper cups. Since the main difficulty that customers feel with reusable cups is maintenance inconvenience, stores should provide adequate washing facilities for washing stainless steel tumblers – the type of reusable cup most preferred by customers. With easy-to-use high-pressure machines designed to wash tumblers, customers will no longer feel any sort of inconvenience related to maintenance issues.

As recognized from the literatures, in order for an individual to move away from a bad habit to a new one, one must have the adequate motivation to do so. Specifically, the customers can be given a motivation for enjoyment and also a motivation to feel a sense of pride. The solution I proposed is to create a system that integrates both package design and smart-phone application. Firstly, the customers will be motivated to have fun by playing a game, either online or offline. If one succeeds on receiving a result corresponding to the number marked on the reusable tumbler, then the application will send a coupon allowing for one free drink. Customers may also gain a sense of pride in using reusable cups by witnessing (via the smartphone application) the progress one makes in saving the environment.

APPENDIX A. INSTITUTIONAL REVIEW BOARD APPROVAL

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
1138 Pearson Hall
Ames, Iowa 50011-2207
515 294-4566
FAX 515 294-4267

Date: 6/11/2013

To: Joongsup Lee
2627 Kent Ave, Unit 4
Ames, IA 50010

CC: Dr. Roger Baer
158 College of Design
Dr. Debra Satterfield
277 College of Design

From: Office for Responsible Research

Title: A Study for Increasing Reusable Cup Consumption in a Coffee Industry

IRB ID: 13-104

Study Review Date: 6/6/2013

The project referenced above has been declared exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b) because it meets the following federal requirements for exemption:

- (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey or interview procedures with adults or observation of public behavior where
 - Information obtained is recorded in such a manner that human subjects cannot be identified directly or through identifiers linked to the subjects; or
 - Any disclosure of the human subjects' responses outside the research could not reasonably place the subject at risk of criminal or civil liability or be damaging to their financial standing, employability, or reputation.

The determination of exemption means that:

- **You do not need to submit an application for annual continuing review.**
- **You must carry out the research as described in the IRB application.** Review by IRB staff is required prior to implementing modifications that may change the exempt status of the research. In general, review is required for any modifications to the research procedures (e.g., method of data collection, nature or scope of information to be collected, changes in confidentiality measures, etc.), modifications that result in the inclusion of participants from vulnerable populations, and/or any change that may increase the risk or discomfort to participants. Changes to key personnel must also be approved. The purpose of review is to determine if the project still meets the federal criteria for exemption.

Non-exempt research is subject to many regulatory requirements that must be addressed prior to implementation of the study. Conducting non-exempt research without IRB review and approval may constitute non-compliance with federal regulations and/or academic misconduct according to ISU policy.

Detailed information about requirements for submission of modifications can be found on the Exempt Study Modification Form. A Personnel Change Form may be submitted when the only modification involves changes in study staff. If it is determined that exemption is no longer warranted, then an Application for Approval of Research Involving Humans Form will need to be submitted and approved before proceeding with data collection.

Please note that you must submit all research involving human participants for review. **Only the IRB or designees may make the determination of exemption**, even if you conduct a study in the future that is exactly like this study.

Please be aware that **approval from other entities may also be needed.** For example, access to data from private records (e.g. student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. **An IRB determination of exemption in no way implies or guarantees that**

permission from these other entities will be granted.

Please don't hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.

IRB ID: 13-104

INSTITUTIONAL REVIEW BOARD (IRB) **Application for Approval of Research Involving Humans**

RECEIVED

Title of Project: A Study for increasing reusable cup consumption in a coffee industry.

FEB 19 2013

Principal Investigator (PI): Joongsup Lee		Degrees: MFA
University ID: 256406150	Phone: 515-509-5870	Email Address: joongsup@iastate.edu
Correspondence Address: 2627 Kent Ave. Unit 4, Ames, IA		
Department: Graphic Design	College/Center/Institute: Design	
PI Level: <input type="checkbox"/> Tenured, Tenure-Eligible, & NTER Faculty <input type="checkbox"/> Adjunct/Affiliate Faculty <input type="checkbox"/> Collaborator Faculty <input type="checkbox"/> Emeritus Faculty <input type="checkbox"/> Visiting Faculty/Scientist <input type="checkbox"/> Senior Lecturer/Clinician <input type="checkbox"/> Lecturer/Clinician, w/ Ph.D. or DVM <input type="checkbox"/> P&S Employee, P37 & above <input type="checkbox"/> Extension to Families/Youth Specialist <input type="checkbox"/> Field Specialist III <input type="checkbox"/> Postdoctoral Associate <input checked="" type="checkbox"/> Graduate/Undergrad Student <input type="checkbox"/> Other (specify:)		

FOR STUDENT PROJECTS (Required when the principal investigator is a student)

Name of Major Professor/Supervising Faculty: Roger Baer		
University ID: 711114293	Phone: 515.294.0679	Email Address: rebaer@iastate.edu
Campus Address: 386 Design		Department: Graphic Design
Type of Project (check all that apply): <input checked="" type="checkbox"/> Thesis/Dissertation <input type="checkbox"/> Class Project <input type="checkbox"/> Other (specify:)		

Alternate Contact Person: Debra Satterfield	Email Address: debra815@iastate.edu
Correspondence Address: 146 College of Design	Phone: 515.294.1667

ASSURANCE

- I certify that the information provided in this application is complete and accurate and consistent with any proposal(s) submitted to external funding agencies. Misrepresentation of the research described in this or any other IRB application may constitute non-compliance with federal regulations and/or academic misconduct.
- I agree to provide proper surveillance of this project to ensure that the rights and welfare of the human subjects are protected. I will report any problems to the IRB. See Reporting Adverse Events and Unanticipated Problems for details.
- I agree that modifications to the approved project will not take place without prior review and approval by the IRB.
- I agree that the research will not take place without the receipt of permission from any cooperating institutions, when applicable.
- I agree to obtain approval from other appropriate committees as needed for this project, such as the IACUC (if the research includes animals), the IBC (if the research involves biohazards), the Radiation Safety Committee (if the research involves x-rays or other radiation producing devices or procedures), etc.
- I understand that approval of this project does not grant access to any facilities, materials, or data on which this research may depend. Such access must be granted by the unit with the relevant custodial authority.
- I agree that all activities will be performed in accordance with all applicable federal, state, local, and Iowa State University policies.

Signature of Principal Investigator _____ Date 2-14-13

Signature of Major Professor/Supervising Faculty _____ Date 2.14.13
 (Required when the principal investigator is a student)

- I have reviewed this application and determined that departmental requirements are met, the investigator(s) has/have adequate resources to conduct the research, and the research design is scientifically sound and has scientific merit.

Signature of Department Chair _____ Date 2-19-13

For IRB Use Only	Full Committee Review: <input type="checkbox"/>	Review Date: June 6, 2013
	EXPEDITED per 45 CFR 46.110(b): Category Letter	Approval/Determination Date: June 6, 2013
	EXEMPT per 45 CFR 46.101(b): 2	Approval Expiration Date: 1/6 - 12/31/14
	Not Approved: <input type="checkbox"/>	Risk: Minimal <input checked="" type="checkbox"/> More than Minimal <input type="checkbox"/>
Approval Not Required: <input type="checkbox"/>		
Not Research: <input type="checkbox"/>		
No Human Subjects: <input type="checkbox"/>		
IRB Reviewer's Signature _____ June 6, 2013		

APPENDIX B.
ATTACHMENTS FOR THE INTERVIEW & SURVEY

Attachment 1. Flyer for Interview Participants

PARTICIPANTS NEEDED to Interview for a Study of Sustainable & Disposable Beverage Cups.

**Are you willing to spend approximately
10 minutes to interview for a sustainable
beverage cup design?**

**If you are age 18 or over and have experience
ordering hot beverages from a coffee shop, and
are interested in participating in this voluntary
and confidential study, please contact:**

Joongsup Lee / 515-509-5870

joongsup@iastate.edu

Attachment 1-1. Flyer for Survey Participants

PARTICIPANTS NEEDED to Survey for a Study of Sustainable & Disposable Beverage Cups.

**Are you willing to spend approximately
10 minutes to survey for a sustainable
beverage cup design?**

**If you are age 18 or over and have experience
ordering hot beverages from a coffee shop, and
are interested in participating in this voluntary
and confidential study, please contact:**

Joongsup Lee / 515-509-5870

joongsup@iastate.edu

Attachment 2. Informed Consent Document

Informed Consent Document

Title of Study:

A Study for increasing reusable cup consumption in the coffee industry.

Investigator: Joongsup Lee, MFA, Graduate student

This is a research study. Please take your time in deciding if you would like to participate.

Please feel free to ask questions at any time. No items will be purchased during the session. No personal or financial information will be collected during the session.

INTRODUCTION

The purpose of this research is to understand the kinds of consumer experiences using disposal and non-disposal cups when consumers purchase a hot beverage in a coffee shop. This research aims to answer the survey or interview questions.

DESCRIPTION OF PROCEDURES

If you agree to participate in this study, participation will last for approximately 10 minutes.

During the study you may expect the following study procedures to be followed.

a. Survey participants

- 1) The principal investigator will send an email enclosed informed consent document to prospective participants who were recruited as replying email. On the end of this document into email, there is a checkbox to confirm whether you agree this document or not. If you agree, check the following checkbox. And when you mark this checkbox, it will be regarded as you signed consent forms. Then you can answer survey questions and reply email your completed survey to PI.
- 2) And also when the principal investigator meets a prospective participant directly, the informed consent form will be read or explained to the subject to make sure that you understand what you have to do and the importance of the study. If you agree and don't have any questions, you will be asked to sign the form to the start of the survey questions.
- 3) When you answer survey questions, you may skip any question that you do not wish to answer or that makes you feel uncomfortable.

b. Interview participants

- 1) The PI will contact prospective participants to schedule a interview and will send informed consent document.
- 2) On the interview day, the introduction script will be read and the informed consent form will be read or explained to the subject to make sure that you understand what you have to do and the importance of the study. If you agree and don't have any questions, you will be asked to sign the form to the start of the interview. If you agree, and sign the Informed Consent Document the interview will begin.
- 3) The subject will be asked to answers to questions that will be voice recorded.
- 4) The interview questionnaire asking for the subject's demographic information such as age group and gender will be obtained.

5) This interview will be conducted in private with a researcher to eliminate the influence of peer pressure. Interview will last for 10 minutes and will be done in a convenient location. It will be audio-recorded using digital voice recorders. Audio recordings will be transcribed to analyze the session.

6) The participants will answer interview questions. You may skip any question that you do not wish to answer or that makes you feel uncomfortable.

RISKS

There are no foreseeable risks in this study. However, you may leave the study at any time without penalty.

BENEFITS

Participants will not benefit directly. However, the findings and solutions of this research will serve as an opportunity to world-wide coffee industries to change adverse images, such as using huge quantity of non-environmental products. Also it will motivate people to change their behavior to more environmental friendly. The final outcomes of this research will help consumers to build a more positive experience when they are enjoying beverages.

COSTS AND COMPENSATION

You will not have any costs from participating in this study. There will not be any compensation to participate in this study.

PARTICIPANT RIGHTS

Your participation in this study is completely voluntary and you may refuse to participate or leave the study at any time. If you decide to not participate in the study or leave the study early, it will not result in any penalty or loss of benefits to which you are otherwise entitled. During the interview, if you feel uncomfortable at anytime you can quit.

CONFIDENTIALITY

Records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available. However, federal government regulatory agencies and the Institutional Review Board (a committee that reviews and approves human subject research studies) may inspect and/or copy your records for quality assurance and data analysis. These records may contain private information.

To ensure confidentiality to the extent permitted by law, the following measures will be taken.

The participant's identity will be confidential throughout the study. Only the researcher will have access to the data. The data will be entered and kept in a password-protected computer located on the PI's computers. The questionnaire will be shredded after all the information is entered into the computer. And audio recordings also will be deleted after saving as digital data files into the computer for analysis. Other data files will be destroyed once transcribed and entered in the computer for analysis.

QUESTIONS OR PROBLEMS

You are encouraged to ask questions at any time during this study. For further information about the study contact Joongsup Lee, Principal Investigator, phone 515-509-5870, email joongsup@iastate.edu and Roger Baer, Supervising Faculty, phone 515-294-0679, email rebaer@iastate.edu.

If you have any questions about the rights of research subjects or research-related injury, please contact IRB Administrator, (515) 294-4566, IRB@iastate.edu, or Director, Office for Responsible Research, (515) 294-3115, 1138 Pearson Hall, Ames, IA 50011.

SUBJECT SIGNATURE

Your signature or marking below checkbox indicates that you voluntarily agree that you can participate in this study, that the study has been explained to you, that you have been given the time to read the document and that your questions have been satisfactorily answered. You will receive a copy of the signed and dated written informed consent prior to your participation in the study.

Subject's Name (printed) _____

(Subject's Signature)

(Date)

By marking the checkbox, you indicate that Subject's Name have read and accepted the terms of this informed consent document. (Online survey only)

☐ I agree.

Attachment 3. Email Script for Interview Participants

Dear xxxx,

I am looking for interview participants who have experience ordering hot beverages from a coffee shop to share their consumer experiences with disposal and non-disposal cups when they purchase hot beverages in a shop.

I will ask prepared interview questions about your personal experiences relevant to this topic using audio recordings and it can be completed in 10 minutes at your convenience at the Starbucks on Lincoln Way in Ames or another mutually agreeable place.

Participation is completely voluntary. All of the information participants provide will be kept strictly confidential and reported in summary form only. No individual will be identified, nor will participants' names be attached to any data included audio recording. At the project's end, researchers will destroy any identifying personal information.

Again, you may choose to withdraw from participating at any time without penalty.

If you have any questions or concerns, feel free to contact us at any time.

Joongsup Lee, Principal Investigator, phone 515-509-5870

Email: joongsup@iastate.edu

Thank you for your time and consideration.

Attachment 3-1. Email Script for Survey Participants

Dear xxxx,

I am looking for participants who have experience ordering hot beverages from a coffee shop to share their consumer experiences with disposal and non-disposal cups when they purchase hot beverages in a shop.

I will ask prepared survey questions to understand what people think about the topic, and it can be completed in 10 minutes at your convenience at mutually agreeable place.

Participation is completely voluntary. All of the information participants provide will be kept strictly confidential and reported in summary form only. No individual will be identified, nor will participants' names be attached to any data. At the project's end, researchers will destroy any identifying personal information.

Again, you may choose to withdraw from participating at any time without penalty.

If you have any questions or concerns, feel free to contact us at any time.

Joongsup Lee, Principal Investigator, phone 515-509-5870

Email: joongsup@iastate.edu

Thank you for your time and consideration.

Attachment 4. Interview Questions for Reusable Cup User

* Demographic Questions

1. Age

☐ 18~29

☐ 30~49

☐ 50~64

☐ 65+

2. Gender

☐ Male

☐ Female

3. Permanent Residence

☐ North America

☐ Other Continents

4. On average, how many times do you purchase hot beverages each week?

☐ Less than once per week

☐ 1~2

☐ 3~4

☐ 5~6

☐ More than 6

* Interview Questions

5. Have you ever brought your reusable cup to purchase your beverages? If you have, how frequently did you bring the cup? And what are your main reasons to select the reusable cup?

6. When you bring your reusable cup, how do you carry the cup? Carrying in your backpack or cup holder into your vehicle? Please describe why?

7. What do you have benefit with using your reusable cup?

8. What are your inconvenient aspects when you are using a reusable cup?

9. Do you believe that using disposable paper cups are a big problem to the environment? Can you describe your opinion why it is problem or not.

Additional comments:

Attachment 4-1. Interview Questions for Disposable Cup User

* Demographic Questions

1. Age

☐ 18~29

☐ 30~49

☐ 50~64

☐ 65+

2. Gender

☐ Male

☐ Female

3. Permanent Residence

☐ North America

☐ Other Continents

4. On average, how many times do you purchase hot beverages each week?

☐ Less than once per week

☐ 1~2

☐ 3~4

☐ 5~6

☐ More than 6

* Interview Questions

5. Do you have reusable cup? Even though you have your reusable cup, why did you use a disposal cup?

6. Do you believe that using disposable paper cups are a big problem to the environment? Can you describe your opinion why it is problem or not.

7. What can you expect benefit when you bring your reusable cup?

8. What are your inconvenient aspects when you are using a reusable cup?

Additional comments:

Attachment 5. Survey Question form

1. Age

☐ 18~29

☐ 30~49

☐ 50~64

☐ 65+

2. Gender

☐ Male

☐ Female

3. Permanent Residence

☐ North America

☐ Other Continents

4. On average, how many times do you purchase hot beverages each week?

☐ Less than once per week

☐ 1~2

☐ 3~4

☐ 5~6

☐ More than 6

5. Do you believe that using disposable paper cups are a big problem to the environment?

☐ I know☐ I do not mind

6. Do you use a reusable cup? ("Reusable cup is a non-disposable cup that is carried around, and available for repeated use.")

☐ Yes, go to 7-1☐ No, go to 8-1

7-1. What kind of reusable cup do you have?

☐ Ceramic MUG☐ Plastic Tumbler☐ Stainless Tumbler☐ All of the above☐ Other:_____

7-2. What are your main reasons to select the reusable cup?

☐ Environmental☐ Safety☐ Economical☐ Trendy☐ All of the above☐ Other:_____

7-3. How often do you use your own reusable cup?

☐ 1(never)☐ 2☐ 3☐ 4☐ 5(always)

7-4. Which one is the most inconvenient aspect when you are using a reusable cup.

☐ Volume and weight☐ Maintenance (cleaning cup and so on)☐ Appearance☐ All of the above☐ Other:_____

7-5. How much interest do you have regarding environmental issues?

☐ 1(never)☐ 2☐ 3☐ 4☐ 5(always)

8-1. Did you know that economic incentives are offered to consumers who use a reusable cup?"

☐ Yes☐ No

If yes, why you don't use reusable cup even though the incentive:

☐ _____

8-2. What are your main reasons for not carrying a reusable cup?

☐ Didn't buy hot beverages often enough to use own cup☐ Inconvenience☐ Not aware of the economic incentives☐ Lack of interest in environmental issues☐ Other:_____

8-3. Which one is the most inconvenient value when you carrying a reusable cup.

☐ Volume and weight☐ Maintenance (cleaning cup and so on)☐ Appearance☐ All of the above☐ Other:_____

8-4. If you decide to use a reusable cup, what kind of reusable cup do you select?

☐ Ceramic MUG☐ Plastic Tumbler☐ Stainless Tumbler☐ All of the above☐ Other:_____

8-5. What are your main reasons to select the reusable cup?

☐ Safety☐ Economic☐ Trendy☐ All of the above☐ Other:_____

Attachment 6. Word of Mouth Script

My name is Joongsup Lee, MFA graduate student in Graphic Design major.

The first aim of this research is to understand the kinds of consumer experiences with disposal and non-disposal cups when people purchase hot beverages in a shop. And the final goal of this research is to suggest an environmentally friendly packaging system based on result of this survey and interview. So I am looking for survey or interview participants who have experience ordering hot beverages from a coffee shop to share their consumer experiences with disposal and non-disposal cups when they purchase hot beverages in a shop. I will ask prepared survey questions to survey participants. And I will have interviews with interview participants using audio recordings. Both of them can be completed in 10 minutes at your convenience at the Starbucks on Lincoln Way in Ames or another mutually agreeable place.

Your Right

Your participation in this study is completely voluntary and you may refuse to participate or leave the study at any time. If you decide to not participate in the study or leave the study early, it will not result in any penalty or loss of benefits to which you are otherwise entitled. During the study, if you feel uncomfortable at anytime you can quit. And all of the information participants provide will be kept strictly confidential and reported in summary form only. No individual will be identified, nor will participants' names be attached to any data included audio recording. At the project's end, researchers will destroy any identifying personal information. If you know someone who may be interested in participating this study, please contact Joongsup Lee at joongsup@iastate.edu

Attachment 7. Introduction Script

This interview will consist of three stages, 1) following introducing the concept of this research, 2) filling out the demographic questions and 3) filling out the interview questions and discuss the open-ended questions.

This study will last approximately 10 minutes.

Introduce a Concept

My name is Joongsup Lee,

Thank you very much for participating in the study, this research is to understand the kinds of consumer experiences with disposal and non-disposal cups when they purchase hot beverages in a shop.

Your participation will contribute to improve the development of an environmentally friendly packaging system.

Your participation in this interview is completely voluntary and you may refuse to participate or leave the interview at any time. If you decide to not participate in the interview or leave the interview early, it will not result in any penalty or loss of benefits to which you are otherwise entitled. During the interview, if you feel uncomfortable at anytime you can quit.

If you have any questions, please let me know.

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